NEWS IN BRIEF

ICL union gives in

UNION opposition to the closure of ICL's foctory at Winsford has now collapsed completely, the local joint Unioo Committee having accepted the inevitability of UPL's takeover of the plant with n statement wishing the new owners "every success".

Winsford staff have accepted redundancy and severance terms and are facing the prospect of joining others already on the dole in the queue fur jobs when UPL starts recruiting, probably around

NatSemi profits

FOR the half-year ended October 1980, National Semiconductor, group and owner of National Advanced Systems, reports sales of all the group products up 40% to \$628 million. Profits for the half-year were \$33.4 million, up 41%.

US military comms

SPENDING on military communications systems in the US will total \$28.9 billion between 1980 and 1985, rising from \$3.8 billion in 1980 to \$5.4 billion in 1980, according to Frost & Sullivan's latest report on the subjects A COMMERCIAL speech recognition device using naw teshinques, and auitable for dealing with continuous speech, which was devised at the National Physical Laboratory, should be on the project manager. Individual consultancy will also be available.

The hardware is as yet incampled the project manager. Individual consultancy will also be available.

The hardware is as yet incampled the project manager. Individual consultancy will also be available.

This front-end hardware is entirely analogue, which is more suitlatest report oo the subject, number 828. The US Air Force will spend the most and its largest project will be in space commu-

NCR made \$1bn

NCR FINALLY broke the billion-dollar barrier for turnover in the last quarter of 1980. The company reported turnover at \$1,084 million for the three months, 10% up on the closing quarter of 1979. This left turnover for the whole year up 11%, to \$3,322 million. Profit for the year as a whole rose 9% to \$254 million. companies aiming to exploit the Laboratory's developments.

Among the members of the Speech Recognition Club are Personal Discourse of the P ranti, Plessey, Nexos, SDL, and Quest Automation. In return for their subscriptions of £8,000 a year they will receive information about NPL's work for incorporating in

Minister calls for viewdata boost

week as Information Technology and viewdata sector itself," Baker Minister Kenneth Baker called for said. "Teletext and viewdata are a "combined and co-ordinated as-sault on the market by everyone the stepping stooes to an informa-tion technology industry and if we

organised by the Department of Industry, Baker warned of the danger of letting the UK'a lead slip away and the need to speed up the development of the home market if exports of the systems were to take

The conference steering comntittee would follow up ideas and proposala made at the confereoce and contact all the 80 participants in the next few weeks, Baker said. "It would aim to decide on s market strategy which the industry as a whole could accept and to which it could therefore commit itself wholeheartedly."

the marker within three years.

That is the prediction being made at NPL following the formation of a nine-member "club" of

At a private conference oo the future of viewdata and teletexr, organised by the Department of Industry. Baker warned of industry. Baker warned of industry. been unco-ordinated, he

> The world market in informa tion technology products already totalled about £50 billion a year and was expanding at about 10% a

year in real terms.

British Telecom agreed to co-ordinate its overseas marketing with the BBC nod IBA so as to present twin versions of the same tech-nology. The BBC and IBA sgreed to push teletext rather than their

two rival implementations of it.

The semiconductor industry (chiefly Mullard and General In-

NPL considers It has made a breakthrough in its basic approach

to speech recognition, quite dif-ferent from those employed else-where. Instead of using pattern matching to look for words or pho-nemes (the phonetician's elassifica-tion of parts of words) the NPL researchers are using especial than

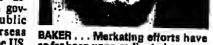
researchers are using special-pur-pose hardware to detect 16 dif-ferent "speech features" which

make up most of the vowels and

OTHER COMMERCIAL VIEWDATA AND TELETEXT INITIATIVES

Philips lovestigates residential user necds.... Chs ap, all-purpose terminal.... TV adapters bring down Prestel costs..... Potential for US services..... Help for travel agents... Voice input for Prestel. NPL sets up technology transfer club

million investment to date by de-veloping more sdvanced chips for viewdata and teletext decoders. Television makers said they would produce smaller and cheaper sets, and the government promised to continue to fund product de-velopment, trial services in government departments, public demoostrations and overseas



Four towns figure in Philips' local study

initiated puli-together for viewdata, Philips has aonounced a trial promotion and investigation of residential user needs, to run for six months to a year.

The trial is to start in April in Brighton, Bournemouth, Harrogate and Norwich, and Philips is persuading other companies, including rival suppliers, to join io.

Philips plans to take a loss on terminals supplied to rental companies in those towns, to enable. them to rent at rates close to the rate for a teletext receiver without making a loss themselves, but the main focus of the trial is to be to

rely analogue, which is more suitable to the job than digital and would not have been possible until

recently when analogue filter chips became available. The output from the pre-processor is fed to software in a Digital Equipment LSI-II where searching for different words can be carried out in offset.

detect the breaks between words.

users would want Prestel for. Information providers which publish local information, such as

Bastern Counties Newspapers in Norwich, are being asked in extend their databases to include things like bus timetables and supermarket prices.

Philips' viewdata marketing manager Julian Horn-Smith said some questions should be answered before the residential market builds up over the next two or three years, on what sort of pack-age of price, information and selling method would satisfy user

limited vocabulary of prohably a few hundred words, Schoffeld

says, so it could only be used for

special applications. Key words

could be searched for in contin-uous speech, but this aearching

could be done in real time, some-

thing that is not feasible at the

Chios were signed in 1978.

The SEMS desl is creding senior French Department de dustry official, who is current leave having spent four me Sources In the Japanese on ter industry are surprised a fi development. Hisself has a extensively to the Chinese self thought to be in the front man-

end-of-year Tax form

now available from the

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French

Chinese

mini dea

THE first licensing agreement manufacture European come equipment in China has be-

signed in Peking by the Pac SEMS group.

The deal, still classed at the is worth F100 million (that) million) and is for the manufac-of the SEMS Solar 16 km

ninicomputer.
The Solar mini is similar

PDP-11 and has been entered sold in Europe by SEMS E

European Space Agency and tracking operations and rese

Control type applications.

Digital Equipmenting

derstood to have compate

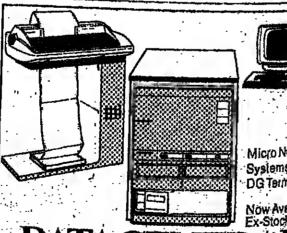
strongly against SEMS for mo

nese contract but lost at the

minute owing to Chines not ence for the French speak which has extensive governor backing. First agreement has

the governments of Frances

for any licensing agreement.
Additionally, the Jspanet poured millions into deviation printers for their own 4005.
Kanji alphabet, which is assist the Chinese alphabet.



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Banks come to ICL's rescue in short term

A £50 TO £100 MILLION rescue package based on short term bank loans is being assembled by ICL chairman Philip Chappell, say sources in the City. Citibank is believed to have off ad \$50 million medium term finance on its

own account. The rescue package has become necessary following a dramstic fall in confidence among ICL's institutional shareholders after a series f unsuccessful meetiogs between happell and City stockbrokers.

The brokers and analysta claim that Chappell failed to snawer any of the more pertinent questions ICL has confirmed that the chairman will make a statement

after the annual meeting next The more pessimistic Citymen 2900 rsnge. Brokers feel that the expect Chappell to reveal that the compony cannot become visble

The more optimistic hope he will reveal s recovery plan which is said to be in the course of urgent

This plan is expected to contain details of government backing, not necessarily in cash, for some or all of ICL's R&D programme.

Reshuffle

A major reorganisation of some of the company's operating divi-sions, with a board reshuffle, is also expected. Some sources say that the US operation is under active coosideration for a sell-off following the collapse in 1500 sales there, and similar problems in the UK, with 1500, System 10 and 7500 machines.

Investing concern now centres on the fate of the large eod of the

place with ICL ss recently as two months ago continue to arouse speculation about some kind of partnership or merger ICL and a fareign partner.

Some analysts perceive that the company could schieve a significant degree of relief from cash flow pressure if enough destocking took place. The opportunities for doing this are limited if the top-end 290 sales are as negligible as so far re ported, and by the fact that the 7500 and 7700 range are still very short of software.

The possibility of an interna-tional trade embsrgo on South Africa, following the coll. — of the Geneva conference on Nami-bia, will present ICL with an early opportunity to step up its sale there, even if the long term pros

Corrigan sets up ULA plants

recognition by computer may sull be "pie in the sky", but the

by Elicen Stainer

UNCOMMITTED logic arrays (ULAs) have captured the interest of Wilf Corrigan, ex-chief executive of US electronics contents, Fairchild. Having given up the position after the Schlum-Burepe, says Corrigan, and will jolo the production of ULAs al-ready taking place in the UK at Ferranti and Racal Microelecexecutive of US electronics company, Fairchild. Having given up the position after the Schlumberger takeover, Corrigan plans to set up an initial ULA factory in Silicoo valley and a second in the UK in two to three years' time.

ULAs are a form of custom-built integrated circuit which drastically reduces the cost of dewith the live broadcast As part of its efforts to provide deaf viewers with subtitles using Ceefax, the BBC has been sponsoring work at Leicester Polytechni on a system that converts phone: cally sucoded syllables entered on an electrooic Palantype keyboard into readable English words. Palantype is the proprietary shorthand system used in US courts of law for recording proceedings on a two-lach paper tape, normally with a mechanical

> are understood to relate to alleged failures in the company's B70 and systems, generating transcripts of Despite the gloomy figures Himmenthal was optimistic about the company's future. He claimed that It is over. But the accuracy of tran-

we will not use our friendship

enuery 20, BBC Television viewers with Caefsx receivars were able to reed aubtities of the speech simultaneously — s "tirat" in television history. Generated by a shorthand translation system developed at Leicestar Polytachnic, the subtities were far from parfact but ware warmly welcomed by many desf-viewers, according to the BBC.

First broadcast using captions from real time shorthand

aoy means" according to one of the

leaders of the project at the BBC, Bill Hawkins. But he added that

REAL TIME continuous speech translatioo of speech tiging major step forward last week when Ronald Reagan's inaugural address was subtitled on the BBC's Ceefax eletext service simultaneously

6700 mainframe at Lelcester, the Palantype translation system was trimmed down for the BBC to run on a Cromemco Z2H microcom Turn to page 8

keyboard. In the longer term Palantype translation facilities could form an important part of electronia office

Profit for 1980 as a whole was equipment write-offs, of which incoming orders oreated new, would normally be unsatisfactory \$81,972,000, a drop of over \$223 more are expected, but also from a records in 1980 and the year-end for office use. The real time system used for Turn to page 9 the Reagan speech generated

INSIDE THIS WEEK'S CW . . .

Computerview on larger ...
Letters to the Editor ...
Gov/industry sollaborate to formation technology ...
Downtline by Chad ...
GRb's Myttiodology ...
Fous on first byte ...
France steps up fraining ...
TA funs into log ...
Micro News ...
Itel problems linger on ...
Business stellites warning ... Op Spot ...

Soft 81 melts away

SOFT 81, the series of projected software shows across Europe run by European Conference Organisers, has been cancelled because of an internal break between ECO's

"The break-up is not directly to do with the shows themselves," said Soft 81 organiser Robert Jo-seph, who has left ECO although still technically a director. "It was more a matter of differing views on

Bomb attack

DAMAGE estimated at £90,000 was caused at a Thomson-CSF laboratory in Toulouse on Monda y a bomb set off by a scil-style 'Lsser' terroriat organisation. Laser" is believed to be the name of a group associated with "Clodo", which specislised las year in wrecking computers.

Second customer

FOLLOWING the installation of an IBM compatible AS/9000 by Guardian Royol Exchange Assur-ance, a second customer has been sites, a second customer has been picked up by National Advanced Systems for the 10 nuips Hitachibuilt mainframe. It is Overseas Containers Ltd, which chose the AS/9000 in preference to the IBM 3081 and Amdahl 5080. It will be consulted to CCI be been been selected. installed at OCL's head office in London in the second quarter this year. 🕆

letters from deaf people about them had been "very enthusias-tic", indicating that most of the Reagan speech had been followed. Developed on a Burroughs **Italian delegation**

A HIGH-LEVEL delegation from the Italian government has visited the UK to familiarise itself with developments in office automatioo. The head of the cabinet office, the director-general of the PTT and banking officials visited Nexos, Racal, Muirhead, ASTC, and Thames Television.

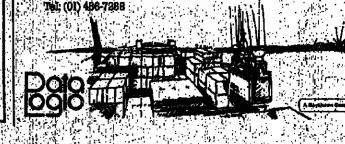
Turn Quay System

erated container facility at Tilbury Docks in Essex. Their minicomputer-based container control system is now an essen-tial part of the daily routine. Visual displays provide interactive cargo planning, taking into account variables such as cargo characteristics and destination. Several hundred thousand units are handled annually.

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A good year for CGS

FRENCH software giant CAP Jemini Sogeti has reported im-pressive figures for 1980 which include a turnover up by more than 27% at £55 million and a 33% increase in riet profits to £2.76 mil-

But the company's UK Interest, IAI. Gemini, was hit badly in the industrial systems area, in the first full year since its formation, from the former wholly. CGS owned Gemini and the special systems

de of international Actadio.

The general manager of 1st.
Genini, Peter Clark, told Computer Weskly that turnover was down from £400,000 in 1979 to £300,000 jast year in the Manches

ter based industrial division.

According to Clark, the other parts of the former Gemini operation, concentrating on commercial work like applications software for microcomputers and IBM retail terminals, were atill buoyant. He said that the special systems operation, focusing on civilian command and control systems, was still doing well. Total IAL Geminiturnover for 1980 will probably

Any device on the market in the near future would have to have a

come to about £1.8 million:
In 1980 hearly £23 million worth
of CGS business came from the
French company and the rest from
its operations outside Hrance
which now include a company in
Norway (see Company News).

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words can be carried out in effect in parallel, so there is no need to Micro Nova Systems and DG Terminals Prices start from £4460 for the MP100 and £5076 for the MP200 eystems. Systems range from liopping disc through certridge to Winchester storage Comma ofter off the shelf delivery of complete.

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NHS ops call strikes

BURROUGHS, the second big billion up just \$71 million on 1979 gest computer company in sales of \$2,830 billion.

America, made a loss of The company, now beaded by

HEALTH Service computer staff throughout the UK are refusing to pay bills or operate accounting systems and will have a series of lightning one-day strikes in pursuity of their national re-grading claim.

This follows light Priday's breakdown of talks at a meeting of the Whittey Council, the body which decides pay in the Health Service. However, officials of the unions involved, Nalgo and NUPE, emphasise they would not take any action to put patients.

The dispute has a 20-year history, When computers were introduced into the Health Service. DR staff were paid at similar rates to clerical grades. But in 1975 Nalgo claimed that DP jobs were now paid at between £600 and \$1,000 a year below the market rate. The unions put In a re-grading claim and a joint working party was set up on mainagement's invitation.

Struct Balley West Midlands District Offices (Health) for take any action to put patients.

Burroughs' \$68 million loss

America, made a loss of The company, now beaded by failures in the company, now beaded by failures in the company, now beaded by failures in the company. This followed a special secretary of the US Treasury, has write-off of \$125 million relating to obsolete and returned machines. Secretary of the US Treasury has menthal was opposed a severe reverse in profits of the US Treasury has being the company a further transfer for 1980 machines.

JOB OPPORTUNITIES: Pages 23-45

COMPUTER WEEKLY

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Congluter-Weekly has nitiroulation; sept week of over 94,000 including the highest fully requested programming in the UK.

chiarpy to this following rates ported in the UK and Erre city?
Company director, or applied secretaries, management service expectatives, originatives, proceedings to prompting research proceedings in the constitution of the company of the constitution of the company of the constitution of the constituti

COMPUTERVIEW

REMLMBER a time before you knew about computers? You probably knew about Tupperware, Delaware, nowhere and undorwear, but you didn't know about hardware and software. For many, these two words, which conveniently separate the kickable from the unkickable, still have the

ring of jargon.
Computer people are undeniably in a jargon-ridden busioess and are sometimes forced to dofend the language they use. That defence is made more difficult as some of the jargon ia sensible — and some is nonsense. We should be mindful of the distinction.

Every trade and every profession has its own share of jargon, which is more or less incomprehensible to niher laymen. Dentists, journalists, road crews for pop groups, computer persoonel, sailors, tinkers, tailors, soldiers and spies all speak io special tongues. Otherwise-normal people go to work and then talk of hooking up a pink noise generator, or going to the galley be-cause the proof is missing, or singling up to a breast and spring both ends, or finding an

occlusal on an upper left six. Hands up those who can say something atelligible about, for instance, a multiple

Some jargon is used an widely that it filters into everyday speech and is assimilated

in the language. The rest of it remains gob-bledegook to all but the initiates. label something without calling up a clear mental picture of it.

Jargon is used for two contradictory reasons. In some cases it tends to precision and in others it is a vague covering for

aloppy thought.

The first reason — and unfortunately the wrong and most common reason - for using jargoo ia to givo the appearance of signiice when true significance is either being hidden, or is lacking to start with.

A fine and barbarous example of this sigificance-seeking came from the mouth of a Ferranti spokesman describing a computer aided design project recently. Asked what exactly was being designed, he replied: "An aerially delivered area denial system." A bomb by any other name. In fact a

particularly nasty bomb with a landmine attachment that does not explode until the area round the crater is thought to be safe. An ongoing area denial situation, so to

Such words are necessary if you want to

Less barbaroua but inner witlespread is the phrase "cost effective", which is estdenuc among people talking and hawking computers. Salespeople are told to say it instead of "cheap", providing an example of an attempt to make the justignificant pale

At a recent Infotech gathering, a hunch of managers agonised over the vile phrase o decide that it atcout "to service the user at the lowest possible cost under current environmental circumstances" What's wrong with "cheap of the price"?

Other cost-effective type hormrs are trade-off, state of the art, leading edge, implement, parameter, facilitate, flexible,

Tho second reason why so much jargon is heard, the one which is defensible end especially pertinent to the computer industry, is that it often describes what cannot adequately be described in any other way: new

words for new things like mice micros, hardware and software. Our trade/profession has a shorter dictionary's worth of a simply because it is so new lake that no ustler ever talked short mail given a cat to look after his ever mentioned updates and page until a word processor cane short not necessity.

gon of necessity Chambers' Dictionary is longer but bears out the distinction for pretentions and the description

retentions and the descriping.
"Jurgon, chatter, mining of slang: artificial or berbases intentionally of a profession."

It is alianse by way of scoreins definition lars jurgon as the large profession." Unfortunately ming profession." pictely sure if we are part of a pole in un nneasy limbo between ti profession. That uncasines a bean occosional insistence on being Drufessional

The uncasiness is also being) monthing of too much jarged for stand. There is, however, a feding

a cabal, n profession even.

But professioo cao be interest pioce of jargon, can't it? There is about people in glass houses....

LETTERS to the EDITOR Answering machines 'suspicion'

THE considerable number of lotters on unsatisfactory telephone when it comes to incoming mesters on unsatisfactory telephone when it comes to incoming mesters of service provided by a business, the equipment used needs to be ters on unsatisfactory telephone answering machines represents a situation not just confined to users situation not just confined to users learning messages. I would heartily recommend that any user conducive to persuading the caller within the computer industry. Over the past year a considerable number of answering machines bave become available for purchase, many of which are unsatisfactory, due to their limited efficiency and/or reliability, which is not a direct function of whether or not such acquirement has Post not such equipment has Post

One type of machine that can be particularly misleading for the

considers only twin caseotte to communicate machines, which will automat-ically facilitate a vortety of content

of dialling tone), or fixed length or no mosage at all.

By and large, people are as suse picious of answering machines as picious of answering machines as their are of computers and them that come of the machines. particularly musicading for the first-time user is a device based on a single cassette tape. This leads to many restrictions, particularly equipment for enhancing the level particularly massized and assure they are of computers and, them that come of the machines with which I am conversant "tick" or frequently malfunction. I

It is in the latter context that most users of answering machines fail. The creation of an outgoing message tape needs considerable forethought as far as message cootent is concerned and the voice that is used must be articulate and

suppose it is like any other type of equipment, you always get what

I will be happy to help any Contputer Weekly reoders who are in need of ossistance and information on the subject, if they will contact me either at our Midlands Office on 054-32 56612, ur London office on 01-734 9776 anytime, 24 hours a day - hy courtesy of our anawering machine service, of ALAN WILLIAMS

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Talking to themselves Wilkes Computing For

that the same variation exists in the manufacture of telephone and swering machines. Since April 1980 machines have been avoilable to a telephone answering machine and the same variation outright purchase ar what appear to be competitive prices. The fact remains that you only get what you pay for; many of these machines are either limited in their swering machines oo a rental basis only. This was subject to their meeting the their subjects published in Compatibility and network compatibility of the position of the complete of their meeting the their meeting.

The limit special point is an experiment to a fone retained the responsibility for publication.

30 times to coincide with a 30 incoming message taking capacity.

mand an Immediate service.

ACP SO and the freight forwarder commenced and the property of public companies of the property of the propert

Joh experience

I AM having the greek inding out how one par ience to apply for points in Computer Weekly.

After the meeting Sir Henry explained that the UK electronics market had doubled in the last 10 years (adjusted for inflation) with Minst jobs require Br perience and when I ath UK manufacturing output dou-bling in the same period. Unforget the same snawer, "h. tunately import penotration had also risen, from 20% to 60%, with greatest inroada being made into the computer field. There is a local colleged. nathmal diploma in me.

Greatest scope for government help existed in the guidance it could provide to help the industry

 Assess market reaction and test Balanced marketing assumptions, such as price and elasticity of services;

The benefits of the demonstra-

Stimulate development and pro-

• Provide information to assist

bublic policy decision, eg UK sa-

betier-off domestic users; and a

dominance of high technology in-

for export markets;

for such systems.

Economic Devolopment Commit-tec (EDC).

The new committee met for the One of the UK's chief problems first time last week, as a result of the National Economic Dewas that oo companies existed with capabilities across the whole specvelopment Council decision, eight trum of information technology, as months earlier, to set up a group to was the case with such organisa-tions as IBM and Philips, said Sir Henry. It was because of this that oversee the rapidly converging and developing areas of telecommunications, computing and microelecthe committee had started to formulate plans for a joint public/private sector demonstration and evaluation scheme for edvanced mmuuicationa technologies. The high-powered committee

There would be no large finan-cial handouts, though considerable

help could be given through a puh-

Govt and industry to

collaborate on

A COLLABORATIVE project to ovaluate information technologies,

funded jointly by government and

industry, promises to be one of the first of a series of initiatives by a

newly reconstituted Electronics

Inroads

members reprosenting loading

companies and trades unions in the

industry and led by Sir Honry Chilvor, vice-chancellor of Cran-field Instituto of Technology, are unanimous in their belief that

the UK ean learn from the policies

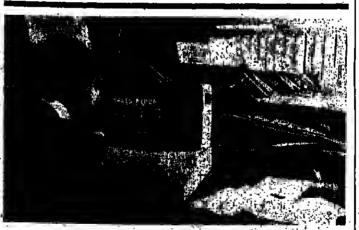
of its competitor nations (see

British Telocom would ohvinusly play a leading role in this project. Initial plans had centred on the use of a "green fields" site, where there was negligible existing investment in a telecommun cations infrastructure. However, i was felt now that a mature, selfcontained and balanced community would provide far better mar ing information.

Micro News, pago 7), where there is considerably greater co-ordi-nated action between individual The chiof components of the project to be evaluated would be a companies, ofton promoted by large fibre-optic cable notwork electronic products, communicating office equipment, and diatri buted data processing. Satellito communications (voice and data) would also be examined.

Hurdles

One of the first hurdles of this project acems to have been cleared in that the Electronics EDC has won the support of the major comunderstand the importance of co-ordinated action to evolve its own attructure, emphasized Sir Honry. 1 of the UK industry has been



ICL viewdata for ME29 users

ICL's viewdate system, Bulletin, its ability to intograte viewdata is to be available to osers of the ICL ME29 in the UK and Holland from oext week.

Is ability to intograte viewdata with existing wird processing needs for E8,500 and data processing needs for E8,500 and from oext week. land from oext week.

Dealgned for use in private

viawdata ayatems, Bulletin was ordered through ICL from Thorn developed by ICL following trials for between £280 and £370 a year, with the Thorntel system used in Models in clude a 26-incb house by Thorn Television Rentellation with a remote keypad tals on its ICL 1900. It implements the viowdate capability with alther a numeric keypad or promised for the ME29 at its alphanumoric keyboard built in launch leat March, since when over 700 have been sold. It will be Our pleture shows a typical available in other countries and Builetin viewdate application. A for other machines in the ICL car salesman is using the Builetin range later this way.

rango later this year.

Rulletin's strength is said to be direct to a computer system.

BR returns to Redifon BRITISH Railways Board has The optical character recognition/ ordered a further seven mixed key to disc system conceptrated modia computer systems from 6 spplications such as payroll, freight accounting and accounts pilot scheme, started two years payable seven from March to December and will shirty system, also from Redifon of the systems. The previous 1750,000 order the previous 1750,000 order was used for the pilot scheme centry being door on paper paper based at British Rail Blemingham.

year and terminals can be

information technology

has risen from 20 per cent to 60 per

It is hoped that by the end of 1981, a specification of the equip-ment to be included will have been duction of systems and equipment drawn up, and commitments made by participants. However, it is not envisaged that marketing information would start to be produced until 1985. Provide a shop window for ex-

In addition to the demonstration project, the reconstituted EDC will work on a number of other fronts. It will review the atructure port sales; and
Stimulate "information providers" to supply date and services The most likely area for the of existing public arrangements on demonstration sito is one con-taining a high proportion of com-mercial users to domestic users; e R&D to ensure they are enherent: it will work to identify mechan-isms to encourage both the growth and formation of small firms; and will set up an Employment Task Force to solve manpower shortage high proportion of well-educated,

Amdahl to develop solid state file nology is implemented in 16K MOS RAM chips and is expanda-

memory. According to Storage

the 4305 can be sold at this price

because main memory charges are kept artificially high by IBM.

The data treosfer rate of the

4305 is limited to three mega-

bytes per secood at the momon

because of the 3880 cbases speed, eithough Storago plans to

briag out faster models for bosts like the Amdabl 586.

state replacement for the IBM

Intel also now offers a solid

ductor paging and swapping file similar to the 4305 sold by Storble in 1114-megabyte modules up a maximum of 45 megabytes. age Technology as an alteractive to the IBM 2305 fixed bead disc At £200,000 for the bigges unit, the cost per bit of the 4305 eompares favourably with fixed head disc storage and is a lot lower than the cost of main

One aim of the high speed file project is to take adveotage of the six-mogabyte por second data traosfer rate provided by the block multiplexer channels on the Amdehl 580. This is the machine launched by Amdahl ea a coonter o the IBM 3081 (CW, November

/, 1980). Amdahi sees an I/O bottleneck being ereated when the 580's channels ere linked to the IBM 880 disc drive controller. Its data transfer rate is limited to three megabytes per second, the same as the 3081 channel speed.

2305 called the 3805. Nooe has The 4305 from Storogo Tech-

boen sold yet in the UK. Two 128K ROMs from NEC

ROMs are expected from Nippou Electric in April. Production is planned to the second half of the year at a rote of 300,000 devices a

The first, an NMOS device, is

of 275 milliWatts maximum

The other has been appelled i CMOS with a four microsecond access time and a 30 milliWatt ac-

Think of a Vacuum cleaner and what Certainly not J.Murray Spangler. Yet his was the first upright suction sweeper the So why didn't he clean up? Lack of money, or business acumen? Or was it an absence of the right business partners? Probably a little of all three. Had our friend been around today however, his fate may well have been different. For now there's a ready source of finance designed to help teams of technological entrepreneurs set up their own businesses. Provided today's Mr. Spanglers can convince us their innovation and chances of success are promising. we'll back their enthusiasm with our own. And with something a little more tangible. 45,000 to £2,000,000 in venture capital. You won't find us mean with help or advice either. Our staff are all experienced in the kind of problems a new technological company may have to face: And we're quite adept at devising original Some might even say inventive. TDC

standable irritation of P. Barker (CW, January 8) at the performmachine, and I am concerned that o number of machines now on the market could bring the telephone answering machine manufacturing and distributing industry into con-

Whereas the general public re-cognises the difference botween a mini-moke and a Rolls-Royce car, they do not appear to appreciate that the same variation exists in the

This, of course, is ludicrous and in addition the machine with this

system does not allow for error if the user makes a mistake in any one of the 30 recordings. The mistake cannot be erased and a new tape has to be obtained. Other machines at this end of

the market do not have call coun-ters and others do oot inform the caller when they are going offline. The oet result is that there must be

paying for an instrument that they wish to have online 24 hours a day. tal only policy ensured that machines in use could be traced for modification and, more importantiy, the customer was and is, entitled with a rental basis, to de-

The message is elear. Businesses should opt for the security of ren-tal agreements if a reliable, ongoing service la needed. Buying the machine could result in having

Home and Export Sales

BOS to Followed Company Ltd. Wilkes Computing.

let (027a) 25931 fellow 1490

Would you credit it?

HERE'S an interesting twist to the on-going imbroglio over Women's Lib, attested to by an unimpeachable authority, namely, a Computer Weekly

When our Software Editor
Claire Gooding was living in
South Africa she went into a
branch of the Standard Bank to
ask for a credit card, expecting
the usual touchy questions

the usual touchy questions.

Asked the bank man, "How much does your husband earn?" (listen to Germaine Greor's hackles rising already), Claire re-plied, "1,000 Rand," Then she was asked, "How

"700 Rand," she said. "That adds up to 1,700 Rand, vhich is over our lower limit.

l'ine, you can have a card."
At that, Claire was given her card and home she went, satis-



"The automatic phone-an-

the same bank also to get a card.

you cam?".
"I,000 Rand," he replied.
"Sorry, that's not enough —
you can't have a card," he was

all, and the poor man eventually

stormed home, cardless and fum-ing. He wouldn't speak to Claire for several hours!

He was asked, "How much do

MY moans about my telephone answering machine (Downtime, November 20) have prompted a couple of leners, one from a fel-low-sufferer, and the other (see page 2) from a rival supplier.

This latter gentleman, from Ansacoc, criticises the design of the GMTC machine under question, which is missing the point altogether. The choice between the features of the myriad of machines on the market is something the buyer has to make, and this indeed I did, after collecting so much information I'm

thinking of setting up a database. I decided that my machine was the most convenient to operate, after the initial nuisance of recording the announcements.
The question is, is the manufacturer eapable of making a machine that does what it was designed to do? I have now had four machines, and each has worked worse than the previous one. Come back, oh First Ooe: the clicking noise you made is (almost) forgiven!

I have also had reports of three other machines, which were all foulty as well, I am thinking of offering a prize 10 any (indepen-dent) person who can show me one of these contraptions that ac-

When those machines

tually works properly.

But I haven't updated you on my on-going saga, have, I? I took the first machine (with the maddening clicking noise) back to the

dening clicking noise) back to the shop, where the man said "Oh." He took it away and a week or so later said, "It has no defect."

Said I, "I know that. How shout the newer model which makes less noise?" After some more weeks the shop man came up with one of these. It was indeed quiet enough but did have a defect—it recorded a buzzing over the message. I took it back.

"We'll fix it," he said.

He didn't—be gave me

He didn't - be gave me another one, and the buzzing on

Thinking that this could go on for ever, I rang up the supplier himself, asking, "Why are your machines so badly made?"

- that functions as complicated "Nonsense, nonseose," said be, "bring it in." So I brought it in, and to demonstrate the fault, asked the demonstrator girl to as these cannot be performed reliably at this level of the technology. It is also funny that some of the changes that British Telecom bas insisted on for the demonstrate recording the anmachine to be approved have in fact made it work less well.

First

(FOCUS

a backroom boy annunced. "This machine is faulty." Oh, so ACCORDING to a report in the highly-respected US publicating Business Week, personal computer suppliers have discovered a particularly lucrative market the professional company manager and technician.

It could be that it is Business Week which has made the discovered week which has made the discovered with the suppliers of the suppliers the suppliers the suppliers the suppliers which has made the discovered which has made the discovered with the suppliers the Still with me, dear readers? They gave me another one fixing a machine requires knowledge, you see). This has a cracked power aupply and the unit itself has all kinds of interesting symptoms: dropouts, flashing error lights, refusals to

Week which has made the disco time to figure out the fault, namely that the pinch roller is ery, the personal computer will being closely involved stready is

the professional user market place.
At a recent IDPM Central Lac. don branch meeting, several speakers representing large arguitheir businesses knew how man microprocessors were opening within their respective companies

Porhaps the main factor at vanced for the spread of the care. tive level micro is frustration with the in-house data processing de-

Besides being regarded as unge-ponsive to user oceds, the trid-uonal computing service is deemed inflexible and slow in responding to changed circumstances such a new applications or revised

Mandate

If that is the case, the DP tes should be thrown out together with the CPU, peripherals and cilsrias rather than bringing in dividual processing power.

If the computer team's working

means that line management has seck alternetive means of compeling support, the DP section would seem to hove a clear mandate in ** more funds to meet the necessity

whether the funds provided as support additional in-house passonnel or equipment, or just it sufficient to rent computer the

organise promptly.
It chuld just be a matter of all cating ptlorities with payroll, VAT and accounting procedure change ranking high on any sciling

programme.

Matters relating to such area a providing additional management information and statistics or form: redesign should be assigned low

articles and features extolling the the individual involved is going to find time to develop his own

It could be that the personal computer world hes missed the businessman's bus, with the more meot towards distributed onlin processing and remote terminals feature if not a status symbol of most user management desks.

There is neither a requirement

oot space for individuel processing units but there does remaio a considerable market for the micro at 4 point where the minicomputer

point where the minicompact leaves off.

The small business partnership company or operation, who excluded from the benefit of excluded from the benefit of compitter power; can now be fully independent of shared services bureaux or time sharing system.

It is this market which present most concern to the DP poler slonal. Controls, standards dependability and servicing are often sparse at best and there is always the danger that the towary and coprotected buyer could cope seriously unstuck.

It is essential that the industry watchdogs, the BCS and NCC, as sue some guidelines and possibly regulate the proceedings.

Seals of selling approval and codes of buying practice are loss overdue. The BBC is presenting shortly a series on microcomputers called First Bytes. Let us hope that the advice they give will green first time business there is from string butten.

France steps up computer training

from the universities and institutes

400 micros

All students in the third year of

Bachelor of Science courses will

get basic training in data proces-

WHILE UK training pisces for computer programmers and systems analysts stay state, France is embarking on a four-year pro-gramme to train an extra 600 computer engineers annually and to oclude dats processing in all university courses for scientists.

and the ministry of industry's computer agency have announced a 70 million francs programme in-cluding posts for 60 teachers.

The government computer agency's president, Bernard Lorimy, says 120 of the new engineers instruction. Some 400 microcomand systems analysts will be puters will be ordered to train the

trained in France's elite "grandes 55,000 students concerned, and by next year two out of three uodergraduates in science faculties industry, business and the Civil Service. The others will graduate

The government computer agency will make 360 computers available to the "grandes écoles" and technology institutes in order to develop instruction in micro-

Agency president Lorimy says this programme will guarantee that France trains enough computer specialists for the 1980s. But they admit that the number of job openings in data processing is im-possible in predict, even in the MEMBERS of Parliament and those in the Industry wishing to influence them now have a joint organisation for the exchange of information, following the official merger of the All-Party Commit-

exhibition nn education and training are to be arranged for the spring and summer, and Philippe Dreylus of Cap Gemlni Sogeti has agreed to address the group

the French computer industry compares with the British.

The new name of the group, abbreviated to PITCOM, replaces the less manageable AP.

computing are involved, includ-ing robotics and process control, and not just the Department o industry's concerns but those of the DHSS and DES.

Secretaries are Lord Lloyd of Kilgerran and Brian Murphy of CL. New members are being should contact Richard Marriott at IBM, Wigmore Street, London.

US computer exports \$6 billion boost

1980, US exports of computers and electronic office equipment execeded imports of theso machines by \$4.24 billion. Last year's figure was \$4 billion for the

ee on Information Technology (MPs and peers) with the Par-

amentary Computer Forum (the

outsidera' group). The new body, called the Parliamentary in-

formation Technology Commit-ice, is chaired by Ian Lloyd, Tory MP for Havant, and is already

The Computer and Business

balance for 1980 reaching between \$5 and \$6 billinn, the highest yet. CBEMA's 36 member companies (including IBM, Texas Instrumenta, Xerox, Control Data and Digital Equipment Corp) generate

The OS pureau of the Cersus reports that US exports of computers and computer parts totalled \$5.4 billion during the first three quarters of 1980.

DURING the first nine months of Equipment Manufacturers Asso- worldwide revenues of about \$5

GILB'S MYTHODOLOGY

Don't jump — simplify by taking several steps

SYSTEM planners seem to think that design and implementation problems need to be solved all at one tinte. The ideal of the lotegrated system which does all tasks is still living in our practices. We are often forced to break

down gigantic undertakings into more modest phases of implementation; but then we seem to do so reluctantly, and with a sense of having been defeated in carrying

I suggest that we adopt a dif-ferent mentality towards system plans. We should recognise that it is often in our interest to divide up a development process into many smaller steps of progress. And we should appland the designers and planners who manage to identify planners who manage to identity relevant steps. I believe that they are demonstrating greater imagi-nation and talent in their work, while at the same time showing maintify and caution in not trying to accomplish too much at once;

20,000 titles

As a simple example, let me grammed scan.

We managed to classify some eight different languages. We last manual phase, offeo re all classify the book by which languages. We last manual phase, offeo re all classify the book by which languages. We last manual phase, offeo re all classify the book by which languages. We last manual phase, offeo re all classify the book by which languages. We last manual phase, offeo re all classify the book by which languages. We last manual phase, offeo re all classify the book by which languages. We last manual phase manual work clude this in the database.

It was obvious to us that we had clude this in the database.

One option was to get some people actually to examine the utles and also the actual books, and then to write down a language code on a form for lator keying into

Another "all at once design" was to imagine this fully automated by some programmed examination of the title content and perhaps the author. Books like Heyerdahl's Kon-Tiki, however, cannot be determined by any examination of author and title, and full automation would be an unatfull automation would be an unat-

full automation would be an unattainable ideal in any case.

We solved this problem by a series of about 12 very simple programs (each written in less than a day, or less than an hour) which concentrated on automatic determination of the easy and certain alternatives. After each phase we checked that it had functioned accurately, eliminated those classified titles from our work file (thus, simplifying the remaining task) and examined the remaining file to determine a promising next programmed scan.

Camputer heft

Not the Computer hasn't gape means. There is into policy in seeling a computer when, processoring all can be unliked to assist the title if his aim of separating the Company from its assess probably these trieves are average amproves with no previous company record and the number of Complete assisted froudays arowing cach year.

Whist can be done about it:

Surprisingly it is not artifications problem.

Our next Londolfo seemand problem.

Our next Londolfo seemand problem.

Our next Londolfo seemand problem.

Indeed on Deantify Fieth Rossing and consumbancy profronted out a manifery of internationality. Principles on Deantify Fieth Rossing and consumbancy profronted will be held on Deantify Fieth Rossing Definitions.

Tickets are £75.00 page £1140 Wile each tigger:

SHERISHOUS (1997ED 52 HGH STREET (LINBRIDGE WELLS KENTIM) IXE

Key concept

software in increments is a key integration engineering concept."

And Harlan Mills (the original chief programmer) in the same publication cites an interesting practical example. "A Navy bell-copter/ship system, called LAMPS was a four-year project of over 200 person-years of effort, developing over three million and integrating over seven million words of program and data for eight different processors."

by programm log the greater volume. It also seemed that it was much easier to do so in a series of have called it in my earlier

programs than by trying to design one program that thought about all possible word combinations in so many languages. Is a title with BT and TU French or Latin or Norwegian? If we made a mistake on one of the place. on one of the phases, we could easily rectify it without impacting

Michael Dyer of IBM Federal Systems Division (IBM SJ 4/80) p.458) says: "The development of software in increments is a key

recently unearthed in Tokyo, reuseful parts of a system can be
cognised this in December, 1975 delivered much earlier (years),
(IEHE Trans. of Software Ring,
p259) in their Iterative Enhance—
delays involved when we inte-

writings) in an extraordinarily complete and insightful way.

They speak, for example, of "the difficulty of doing a good complete project design initiation."

ally". "The importance using a simple approach in the ini-

ment: A Practical Technique for grate" them with possible later detailed and highly quantified case study of such a development, they many the study of such a development, they many the delivery instead of study of such a development, they many the delivery many the study of such a development, they many the study of such a development of the study of such a development of the such as th Management do not want the

CONFERENCES WRABLEY Conference Centro is the venue for the President Software Conference and Englishment by Historia December 14. Organised by Historia 14. Organised by Historia 14. Organised his event as appropriate a posterior from the arginists of Data Processing Mathagement, and the Colinguist Software Association has expressed its support The thouse we preside to attract and very vendors senter in attract and very vendors senter management, and software vendors senter management, and software information telephone Chris Confidence information telephone Chris Confidence 1 (Serventor 1).

many, will be held in Cologue from
November 4-6. The event, organised
by Deutsche Telecom, is expected to
attract all users of relecontinuational systems, private of professional users
public authorities, magnificturers and
no on. The Trade Rahibition for Telecommunications will be staged with
the Convention Festures will include
network diagnosis, relecontinualization
systems, component parts and modules
and wide band communication. This
regard is being organised by the Cologue Trade Fair Company Furtherinternational Trade Fairs, Messaguation
[Costfield 210766], D-58000 K-5 in 21.



through in my helpful way. After about an hour of fiddling around

answer. It has taken me some

out of alignment so it slowly

I suppose basically the

machine is trying to be too clever

mangles the tape.

whole dream project in several years, delayed and well ovar budget. They want the critical resuits as soon as possible, this year. You can give it to them by imaginative untangling of the rats' nest of com-plexity which seem to describe

But I hope that this oote, oo the

on their own.

Evolution beats revolution on all

using a simple approach in the initial implementation". "As experience was gained by using (the new system) oew features were added and old features were modified oo the basis of this experience". "Thus user experience played a major role not only in the implementation but also in the specification". "The development of a final product which is easily modified is a by-product of the iterative way in which the product is developed."

Space does not permit more than a sampling of the excellect insights and experiences in both the above sources. many of the large projects, and many small ones, which I see among my clienta. My experience is that it is very difficult to teach even experienced system planners how to do this by

writing or lecturing. It is like learning to drive — you oeed hands-on experience with an insimplification principle of planning many rather than one or a tew implementation phases, can be of inspiration and support to those who wish to follow up this subject on their own

developing over three million and integrating over seven million words of program and data for eight different processors in 45 incremental deliveries. Every one of those deliveries was on time and under budget."

Basili and Turner, in an article I added. It is the fact that major recentiv uncarathed in Tokyo, re- useful parts, of a system can be

TEN YEARS AGO

From Computer Weekly of January 28, 1971.

FOUR British software houses Applied Computer Sciences. Business Software Francisco Programmers, and Programming Sciences International have spreed to form an association to be known as Alfied Software Houses. Arl investigation to the American Express in Holicyns Greup Ltd One-thick of the professional staff, numbering about 45, are to be made redundant at 1900 Propramming UK Ltd Systems international (UK Ltd Systems inter

HOGGING tha keyboard is tha sows' fertility', and we can do an latest creature to be compu-terised; a Humberside company immediate analytic and diagnoscallad Pigtales is using a microcomputer to provide specialised loformation to pig

Pigteles updates its records on 5,000 animals every week, using its own database package called Teiltales. "The farmers don't all want to record the same thing, but they all want to be able to record anything they want. Ooce wa had made that possible for allegements we found to be able to record anything they want. farmers across the country, Qualified veterioary surge oo Bill Miller knows what informaplg-farmars, we found we bad a iece of geograf software on our hands, and we intend to sall it to other Taktrooix users", said

Miller learnt about statistica and computing while doing a post-graduate course on public health at Minnesota, and he was quick to see the potential for service sand in a pockat diary of dete they record every week, and we produce a series of reports. "Most of them used manual

Pigtales was started 18 months ago by Millar and a couple of colleagues with experience in pig-

farming.
About half its ellents are local, with the rest scattered from Penzahee to North Yorks. The commethoda before. This way it's track of how many sows have farrowed in a week, or whether pro-duction is, up to target. We get for a large client as well as ax-farmars ringing up asking "Can panding its bureau business on to you run, a quick check on my an Alpha Micro 1050; 25

T-A runs into a loss

Using graphics to

tion pig farmers oead; and bow to

"Wa have to ba practical - tho

watarproof, and the output easily

understood. You must be able to

read it in the rain and hold it in

one hand. That's why we use

thick A4 paper.
"We chose the hardware -

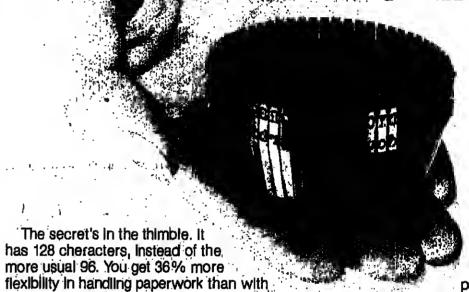
mostly Tektronix - with desktop graphics in mind, as it's the ca-

siest way to put the results soross. The 23 farmers using the

bring home the bacon

TRIUMPH ADLER West German parent company of Adler Business Systems, expects to record a loss for 1980 mainly because of the costs incurred by its US subsidiary, Royal, Business Machines, in setting up a mark Machines and company also sold calculators and copiers in 1980 came to about 1.6. billion marks, well up on the 1979 figure of 1980 will be published by T.A in April Machines, in setting up a mark Machines up a mark Machines up a mark Machines up a mark Machines up on the 1979 figure of 1980 will be published by T.A in April Machines up a mark up a mark up a mark up

You have every reason in the world to switch to NEC's "thimble" printers. Here are 128 of them.



most of the dalsy-wheel and golf-ball print

Germen. Scendinavien, name it, And one

impressions. Quietly, quickly.

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thimble will last more than 30 million clear

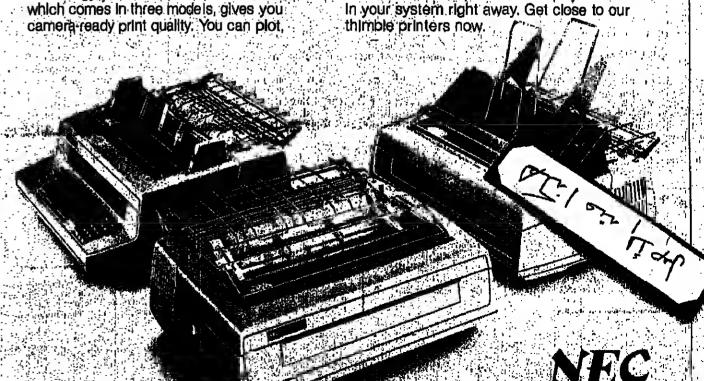
elements of other printers. In English, French.

Thenks to our own LSI and microprocessor

technology, the NEC Spinwriter Series 5500;

graph, superscript. subscript. Tab horizontally or vertically. And print bidirectionally.

Changing thimbles end ribbons is a snap. Also, system modularity means your Series 5500 printer will grow as your requirements grow. And one of the nicest things about it all is that it really won't cost you a thing to switch. 7 interface capabilities, including those for Diablo, QUME and Centronics, means the NEC Spinwriter is ready to work. In your system right away. Get close to our



Drummand Street Landon NW1 3HP UK Tel; 01-388-6100 Telex : 281914 NEC Telecommunications Europe Co., Ltd. NEC House 100, 168 D (Infinition Street London NW1 3HP U Thame Systems Ltd. Triame Park Industrial Estate Thame, Ocon OX9 3R3 Tel: Thame (084 421) 5471

by Eileen Stainer

Communications boost for IBM small systems

nications for the System 38, improved Systems Network Architecture support for applications programs on Series 1, and 3270 ties for the System 38 over the next emulation on the 5280 distributed data system are included in the clittch of new products announced last week by IBM's General Systems Division (CW, January Systems Network Architecture

The BSC support on System 38 will be available by April, 1982. It will enable the machine to communicate over telephone lines with 370, 4300 and 30XX mainframes, with Systems 3, 32, 34 and other System 38s and with the Series 1 and the 5110/5120 desk top machines. It can also link up with a variety of terminals, including the 5280, 5230, 5260 and 3741, but

The start of SNA support for the System 38 has now been moved forward in April this year. Other new facilities for System 38 include several programmer productivity aids, incorporating a leature called Screen Design Aid (SDA), for generating application

Remote Job Entry (SRJE), in each case in a 370, 4300 or 30XX host.

In a "statement of direction" in its costomers, outlining plans for further communications capsbiliplication on the remote host. three years, IBM promised that it would add BSC Multi-Leaving Reduct is the Communications Monitor, a licensed program product that manages communications between two Series Is, between a

> between Series 1 and various 1/O IBM has also jumped on the local "ring" hondwagon, albeit in a limited way, with the Local Communications Controller. It takes the form of a single PC card added to esch Series 1 and cnables up to 16 of them to be interconnected in protocols over a BSC network, as

Scries 1 and other computers, and

Series 1 enables applications programs under either the RPS or EDX operating systems to communicate with a CICS or IMS ap-18M expisins that each Series I

can direct messages in ony other Series I unit in the "ring" without the need for a master controlling Each Series 1 can selectively

broadcast to any or all of the other Series I units, by means of user-

The 5280 distribution data system can now appear to a remote host as a 3270 controller in either s 8SC or SNA environment. Opera-tions supported include batch o "ring", with full duplex trans-mission at up to two megabits per well as interactive working under either 8SC or SNSDLC.

Thomson-CSF begins production of household computers

THOMSON-CSF is tu begin manufacture of personal computers at retail prices ranging from Sharp, Matauahitn, Commo-1240 in £330 at its factory in Mou-lins, central France, at the end of Thomson-CSF's chairman,

ica for the consumer in France is going to have a name: Thinmson." Wahlain said the Thomson

household equipment, questioo viewdsta-type data banks, plan home budgets and be gesred to function with France's future

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set type and the print-out a computer or word processor delivers. # Phototypesetting not only looks more professional. It can make significant savings in paper, postage and handling costs because the material is presented so compactly.

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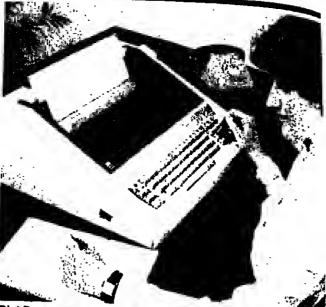
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Digi-Date sess lightness and compactness as two of the min ettrections of its Model 1518 printer terminel, shown here. k. welghs 42 lba and massures 21.9 x 18.5 x 8.5 inches.

Digi-Data launches its first printer terminal

supplier of magnetic peripherals, Digi-Data has moved into the printer terminal manufacturing business with the launch of the 2510 series of high speed matrix units. They compete directly with prioters like the Texas Instru-ments 820 and the Tolly T1612.

Digi-Data is seeking UK distri-butors for the 1510 terminals he-cause end user sales ere expected to account for a much higher proportion of shipments than with the company's tape drive and controller products. The first to be signed up la Dicoll Electronics of Basingstoke, liest knuwn as o aupplier of systems bosed on the Digital Equipment LSI-11. Two more distributors are being

formatting features like margin and tabs, horizontal and vertical

pitches and underlining. Performance features include: achieving throughputs between 31 and 200 chps prioting specificachieving throughputs between 31 and 250 lpm and a maximum base rate of 19.2K-bsud. An optical extended buffer can hold s 148 and 148 least throughput buffer can hold s 148 and 158 least throughput buffer can hold s 148 and 158 least throughput buffer can hold s 148 and 158 least throughput buffer can hold s 148 least throughput buffer can hol character by 25-line screen.

The 1510 family comprises to models at the moment, the 216 KSR version which costs flas aud the Receive Only 2511 pixel at £1,070.

Monufacture of the 1510 tens nals is carried out in the US h Digi-Doto itself, apart from k ought.

An interesting aspect of the 1510

Siegler.

Yorkshire Bank orders De la Rue cash dispensers

TO speed up customer service, the Yorkshire Bank Group has placed an initial order with De in Rue for 10 of its new 1320 teller assist cash diapensera. The 1320 operates in stand-alone mode and enables a cashier to dispense any mix of up to four note denominations. It also prints a record of all transactions.

The microprocessor-based 1320 can be tailored to suit the requirements of individual banks including data recording, cashler iden-tification, cuatomer account

grand totalling of dispenses A displays messages to guide be cashler through each stage of

De la Ruc is well established the cash dispenser business. supplies mechanisms on an OBM basis to manufacturers of through the-wall units like NCR and De-

Teller assist systems like in 1320 are designed to speed up its cashiog of cheques by cashiers.

Measuring up to DP

THE French Thomson group'a TITN company has edded to its activities the production and marketing of measurement date

processing systems.

TITN is challenging the dominant role on the European market of the US firm, Tesdata, Its target is a 100 million franc (about 194,585) turnover by 1985. Be-

tween 25% and 30% would be a rived from exports.

It sees a big market ahead for at DPMS 1000 centralised measuring logy system which links measuring equipment by telephone lines.

The DPMS 1000 makes possible worldwide weather forecasting by correlating a wide range of met

GREATER MANCHESTER POLICE

nstable, Greater Manchesier Police, Computer Project Bos dgley Park Training School, Prestwick, Manchesier M25 8J

UK can learn from

rivals in govt aid to electronics, says EDC

search. On the equipment user side, awareness is promoted. The EDC points out that the more cu-

ordinated this promotion is, the

existing constraints. In particular,

lapanese policies have always

aimed to promote continun technis-

logical targets through co-opera-

By sharing application and ose

of basic technologies, the Japanese

have managed to avoid intense in-

No conflict

The Japanese have been

European policies differ because

dusiry compares unfavourably with that given by its chief compe-titors — Japan, the US, France and West Germany.

MICRO NEWS

At its first meeting, the restruc-tured Economic Development up to now they have been designed to encourage existing firms within Comminee (EDC) for electronics agreed that there is considerable scope for changing present policy within UK industry and government. These main changes of policy are likely to be implemented in the form of co-ordinated uational R&D and marketing stra-

Japan, West Germany, France and the US all experience faster ternal competition and concentrate on competing with the US in an effort to close the technological growth in the electronics industry than the UK, and, as the EDC gap. points nut, there are several striking similarities between their poli-

The key word singled out by the EDC appears to be "co-ordination". In each of the competitors' policies a single institution develops policies, assesses priorities and implements them over long periods, working closely with the

Research and development is promoted by this institution, but sensibly shared nut. For example, only a limited number of firms

many other industries because no conflict exists between the aims of national policy and the aims of in-dustry. The EDC points un that Japan has a market economy

guides and assists. The Japanese Ministry of Inter-national Trade and Industry also guides the electronica industry without funding. Its total funding

hence the government merely

Japanese build trial **GaAs computer unit**

GALLIUM arsenide (GaAs) large facturing and development prob scale integration devices have been developed by scientists of the Japanese Ministry of International Trade and Industry, using a new method which has facilitated the implementation of such devices within a trisl computer unit.

The research team of the Electrotechnical Laboratory, Agency of Industrial Science and Technology, has built the trial computer unit using line geometry of three microns: It comprises 11 elements and can achieve speeds of 120 picoseconds per element with a power consumption of 10-12

milliWatts.
Unlike silicon devlees, gallium arsenide elements are suited to superfast computers, because of their high operating speed and low power consumption. Up to now, application in computer systems

The new method developed by the research team involved the applicotion of a special Schottkyeffect junction to replace existing bulky, power-consuming Level-Shift circuitry. The gallium arsenide semiconductor used was the Normally-On type which required connections between each pair of elements to control their voltage

The team considers that if the rrial computer unit is token down will be possible to get down to speeds of 50 pleoseconds, maybe 20 or 30, and s reduced power consumption of a few milliWatts.

An official programme to de-velop such a computer is pisoned this spring by the Ministry of In-

Voice control in VLSI design

A VOICE recognition module . The company claims that Har-called Harmony has been designed mony can save a designer between for use with a very large scale inte-

called Harmony has been designed for use with a very large scale integrated (VLSI) circuit designing system.

US company Calma, based in the sillcon valley, developed Harmony to give the user voice control of a computer system.

The voice recognition modifies attaches to the company's vector memory display regranded which in the connects to and controls the operation of Calma's Graphic please. The words ore initially recorded and stored from the user of special learn system.

Toy boom on the decline

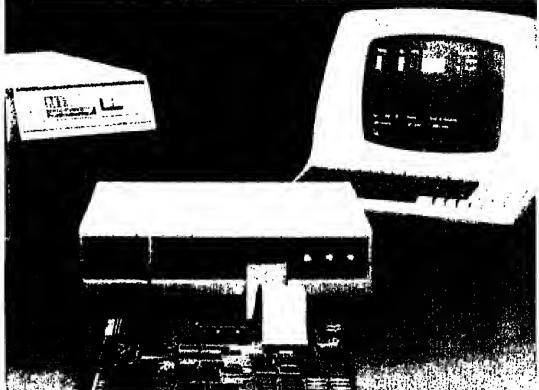
DBMAND overtook supply is attout \$450 million. Christmas in the electronic toy and game business, but the boom is not likely to last, according to industry studies.

From 1977 to 1978, US sales of sectronic toys, and games increased five times over, while from 1978 to 1979 they impled in the period 1979 to 1980, sales were expected to double but shey have increased by only 10 to 20% to

new technology is bought at the lowest price possible by the most suitable company, thos ensuring an efficient policy. The EDC indicated that the UK

should he setting up co-ordinated projects involving major UK electrunics enmpanies like GEC and Plessey, in the same way as the Japanese have done both with LS1 and VLS1 circuits. These conpanies could then hear the cost of a centrally co-ordinated research Representatives of electronic

companies on the committee, which includes Ferranti, Thorn-EMI, Philips Industries, STC, ICL, Racal Electronics, Plessey, GEC, and the Post Office appear willing to take part in such an ac-



Zliog's ZSCAN 8000 development system operates with a heat computer to provide smulation for

National's **ADD-IN** memory board: for PDP-11

Computers: The NS11E featuring our ECC correction code eliminates mistakes quicker than they're made. What's more, your operating process won't be interrupted.

NS11E offers a memory capacity of 128 KByte (64x26). The newly developed correction procedure checks every single Byle but won't lose speed in the process. Moreover, it works with only a single 5 voll supply current. (The NS11E fus into the PDP 11/04, 34, 40, 44)

The National Offensive for the 80s.

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IPRITOR is a constored hadbroark of Divisi Powersers Cores

ITEL CORP went to the Federal Court in San Francisco on January law goes, but it was unusual in the computer business. Itel filed for bankruptcy under Chapter XI of the Federal Bankruptcy Act.

Itel, once the king of the computer lessors, was insolvent.

With dabte of \$1.6 \text{ Fill No. 2016} is start other ventures, because In the beginning of each computer less of see for its services as packager—middleman—was added to liel's war chest.

No matter that some of the lessing deals Ister had problems—as

With debts of \$1.6 billion and sasets on its books valued at \$1.1

billion, the company faces a very difficult time. Even though present management entered bank-ruptcy voluntarily, hoping to use certain options under US bank-ruptcy lows to protect Itel as it altempts to reorganise, many difficulties make the situation uncomfortable for a large number of Indi-

viduals and organisations.
The shareholders are obviously affected. So are the banks thar loaned itel money; the insurers, principally Lidyd's of London, that backed some of Itel's deala; and the users of equipment leased from Itel, who now face additional difficulties if they had hoped to return equipment under special provisions of Itel leases.

Itel's fortunes had risen rapidly during the middle of the last decade, with sales and profits peak-ing at nearly \$700 million and \$50 ion respectively in 1978. But in 1979, in the wake of the announce-ment of 1BM's 4300 series computers, data processing equip-ment in Itel's portfolio and the selling became drugs on the mar-

Income fell, profits turned to losses and the company's executives, for whom winning had be-come a way of life, turned into big

Acrimony

The controversy surrounding the company will not be cleared up in the near term. Investigation and lawsuits, revisions of the company's secounts, disputes with customers, lenders and insurers, acrimony among past and present executives all make explanations of what happened clusive. But some of the facts are now known and more will emerge from the atruggle

that is underway.

The evidence points to bad adgmeet, at the very least, Computers were the cornerstone

28000.16 bit processor

■10m bytes Winchester alsk

Mag Tene Berk Up.

4 user Upix V7.ligence

1.45 CT. Pascur Assemble:
£11,000

■ 256k bytes memory

equipment that had a high price-tag. The computer business pro-vided the cash that could be used

short terms would not be renewed.

The insurance was important be-cause the financing of the lease 19. The matter was routine, as the to start other ventures, because in

> ing deals ister had problems — as long as Itel was growing, it was churning up cash.

Debacle

Impressed by Itel's scemingly golden touch, financial institutions of all sizes put money into the hands of the company's managers, expecting their funds to be re-turned, with interest or dividends added, and never expecting a debacle like the one that has ensued.

In addition to some \$440 million now outstanding on loans accured by assets, Itel has debts of \$860 million that are backed by nothing but the hopes of the present cor-porate leadership under James H. Maloon, who once ran Pan Ameri-

There are other lisbillties in idition to these debts, including some \$300 million in so-called contingent liabilities, funds that might be needed for attorneys and the repair or maintenance of chinery in Itel's portfolio,

And there are reserves against the possibility that insurance on certain computer leases, most of it underwritten by Lloyd's of Lonion, will not pay off Itel'a claims

In regard to that insurance, Itel said, in its recent financial reports, said, in its recent tinancial reports, that it expects claims against Lloyd's policies to exceed \$300 million. Lloyd's will not comment on the vslidity of its claims other than to point out that Itel's estimates and those of underwriters may be the object of a difference in opinion.

Lloyd'a insured the computer leases of more than a dozen other companies and expects claims payments to come to something like \$400 million.

like \$400 million.

It may be a few years before anyone knows just what the total insurance losses will be, and the public may never be informed.

The losses at Lloyd's atem from a series of policies that have been labelled 'J' policies because they are written on what is called a 'J' form. In essence, Lloyd's insured various computer lessors against what the losurer perceived as the Computers were the cornections of Itel's business, which also inform. In essence, Illoyd's insured As users have terminated, shipping containers, railcars what the losurer perceived as the tried to reach realistic comprosing conditions of the discussions could well change, as Lloyd's may had never suffered from a lack of confidence, only s lack of foresight.

The insurance was important because the financing of the lesse equipment was based on long-term rentals of the equipment, whether

Deals

As things turned out, many us-ers did not elect to hold lessed equipment for the full terms of their agreements. Instead, they chose to terminate their leases as provided by their contracts. When they terminated, the rentals on the computers and peripherals were lower than originally anticipated, so Itel and other lessors were forced to offer extensions of the leases at very low rates in order to bold customers.
This decline in the market value

of equipment led to claims against Lloyd's, which led to losses far in excess of the premiums paid for the insurance. The insurance was the reason

banks losned money for the pur-elsse of the computer in the first place. Under the terms of Itel leases, the risks involved for the lender were very great compared to those permitted under Regula-tion Y, a banking rule. But with insurance presumably eliminating the risk to lenders, shifting it to Lloyd's, bankers went for the kinds of deals Itel put together.

The users signed contracts that, for the most part, involved termination after four of the seven years. But in the contracts were provisions that in fact obligated the lessess for the full seven years in the event Itel could not find other ways to make the machines bring in adequate revenues, or if Lloyd's, for any reason, did not

Lump sum

In a sense, there were two arrangements mado almulatneously One was a clear heli-or-high-water obligation on the part of the lessee to pay off the lessed computer. The other was a set of promises, insured, by Lloyd's, that were supposed to relieve the initial lessee of obligations if the computer

WITH DISK DATA CACHE

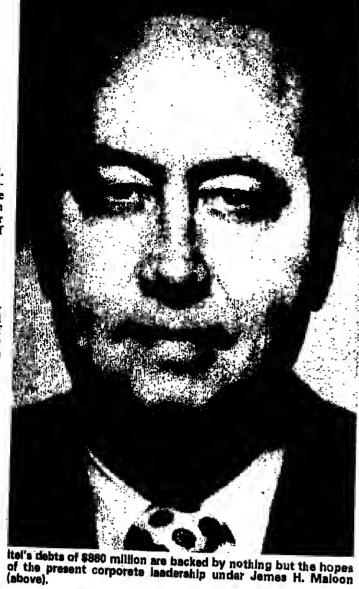
CyPASCAL 28000 Assemblar E14,000

● 28000 1 6 bit processor.

■ 500k bytes memory

Mad Table Back (th

18m bytes Winchester disk



balf of Itel's insured leases have been brought to some state of negotisted settlement by this time.

Typically, Lloyd's will make s lump sum payment to the computer user in return for the user's signing an agreement that removes Itel and Lloyd's from any future obligation. The user's requirements to make monthly payments under the lease remaio untouched. The user then ends up with the computer for the remainder of the full term, typically seven years, but with money from Lloyd's (and, less often, Itel) to partially or fully cover the cost of future

Some lessees are still using these machines, while others, who have accepted the fact of their obligation, are physically keeping the machines but unplugging them to save on maintenance as they move forward from the 370 gapageting to forward from the 370 generation to

newer machines. No two situations seem to be exactly the same. Lloyd's is cootinuing to work with lessees of insured machines, even though there is a provision in

honour sa of legal obligation these

Itel, for its part, must come up with a reorganisation plan. It is due within 120 days of the filing of bankruptcy papers. The plan must be approved by creditors repre-senting the mojority of debt. There are, according to Itel, some 6,000 creditors, of which

some 100 are considered principal lenders. After falling to reach some accord before going bankrupt, Itel's prospects for settlement may be only a little better now.

The bankruptcy enables Itel to cease paying interest on loans—and that cost the company \$150 million in 1980. The law also blocks demands from ereditors for what they think is due to them.

The company says it expects its container and railcar business to make money, thus giving Itel a chance to emerge from bankruptcy at some future date. But for now, with a negative net worth of over \$260 million, the situation is hardly inspiring of confidence.

NEWS IN BRIE Viewdata software for V77 minis

PRIVATE viewdate seitrate run on Univac V77 series mink been developed by London-ke. Detweiler-Thomas, a system liouse specialising in real interplications. Univac is to maked system, which is private. system, which is priced by £14,000 for a 16-port 10,000 to version based on a V77/200 and expandable to a 1,000 to 1,000 expandsble to a 1,000-por me based on four V77/2001 par into s V77/800.

Protocols have also bent a veloped for the mind to from ICL, IBM or Burrought ag

Australia enters **VLSI** stakes

THE Australian government venturing into very large sokil tegrated circuit research for a first time under the directional. Crsig Mudge, who headel & VLSf design team at Divide Equipment in the US.

The project, which is parid!

computing research division of a Scientific and Industrial Research Organisation, is to receive a state funding from the Austragovernment of \$1.5 million.

EEC to use CII-HB software

UNDER a service contrat k tweeo Honeywell Bull (Bere, and the EEC, Cll-Honers Bull's Miatral software will ke in computer searches for in ments by the Commission it European Communities.

The service, which has be operating with Cli-H8's led! will in 1982 uses DPS 7/82.144 be publicly available through a ronet. The target date is 1982, with only limited securi

IMPROVEMENTS in perfers ance and density of NPN bight transistors to ault particular W. applications, have been annound by IBM. Researchers st the I homss J. Watson Research Centre in Yorktown Height, My York have developed an entity mental structure using s new lar lar technology that can swith approximately 100 picosecosa.

Printer plant BURROUGHS is to build

158,000 square foot centre it 0 lando, Florida, for designing in manufacturing what are destributed in the services of the control of the contr people and is due for comp

Business sats to be no cheaper than leased lines

PRIVATELY-LEASED satellite communications links in Europe will be more expensive than all but the longest terrestrial lessed lines, according to British Telecom.

Managing director Peter Benton said last week that the private satellite-based links to be offered to companies as a result of last month's Eutelsat agreement would satisfy an urgent need for links that could be expanded sad redis-tributed rapidly, but for most pur-poses they would be replaced by terrestrial links with the build-up of the Integrated Services Digital Network on which System X would be based.

The first digital private circuits are to be made available during 1983 between 30 of the largest towns in the UK as each section of the digital trunk network is put into place.

The satellite links are due to

start up during the same year, fol-lowing commercial trials planned for this autumn using the Orbital Test Satellite which is already in space, and will be developed aloagside a Europe-wide terrestrial ISDN increasingly based on opu-

Offering s choice of transmis-sion speeds up to 2Mbps, the satellite services are siso seen as complementiog the public packet switched services which offer apeeds up to 48Kbpa. The interna-tional ISDN will use cable, line-ofsight radio and both big-dish and small-dish satellite links as appro-

Terrestrial links are likely to predominate, since they will be more economical by the early 1990s, but if the expected growth rates are strained more satellites will be added to the five currently planned.

Two mobile earth stations have aiready been ordered from Ferranti for the trials this year, and between 20 and 30 are to be ordered for the full service in 1983 from Ferranti, GEC-Marconi and

tions, for use in point-tomultipoint links, cost even less and should there be many applications for this type of link, this is where saeding role in harmonising the European approach to small-dish satellites will enjoy the greatest adcluding the capacity leased from the French satellite Telecom 1, and British Telecom's ahare of the

Sweden to Greece - and a wider

choice of facilities, using either the

cheaper Frequency Division

Multiple Access method with ECS

or the more flexible Time Divising Multiple Access with Telecom 1.

TDMA earth stations cost about

C250,000 and FDMA stations less

than half that. Receive-only sta-

costs will be £8 million. Tariffs will be independent distance. They have yet to be finalised, but will vary with traesmission speed, whether the link is full-time or part-time and whether the capacity is pre-assigned or taken at short notice.

Talks are under way with five or group is to be set up soon, but they find it hard ro investigate applica-tions without knowing the tariffs, while British Telecom finds it hard

as great a variety of options as pos-sible and to respond quickly to the way customers see their needs.

British Telecom claims to have between the European Communications Satellite programme, Plessey at a cost of about £5 mil-lion. The satellites themselves are capacity via large-dish (15 metre) expected to cost £50 million, in- antennae to PTTs only, and

'Unlimited' teleconferencing system on show in UK

STANDARD Telaphones and Cablas has run demonstrations this week designed to convince British Telecom and UK telecommunications managers of the usefulness of a 10-year-old teleconfarencing system made in the US; which is claimed to be able to handle a virtually un-limited number of participants.

Equipment now used by British ence terminal for each site called Telecom is limited to eight state the Convener, to which tions inland and five intereanonally, while STC plans to such as the Telescote televidemonstrate a 20-station intores and slow-scan television systems tional conference from its En- can be attached.

proval for nperation of the system on leased lines end is ex-pected to add switched natwork

approval shortly.

Made in the US by Daroine of Harvard, Illinois, the system consists of a conference bridge called the Meet-Me and a conference.

Burroughs \$68m loss

From front page

delivery backlog was at an all-time high.

Blumenthal said the drop in West Germany, a market where the company has a relatively minor profits related to restricturing, and basically represented a deferral of revenue to future periods."

He explained that the booking of sales had been slowed by a change in delivery strategy which involved putting machines into local staging areas? for assembly and test before delivery. The staging areas are one of the company's not committed as yet. He revealed in a support which Blumenthal recognier coming soul. ing areas are one of the company's not committed as yet measures to improve service and that two new 900 ser support which Blumenthal recognizer coming sout



Two mobile inur-metre earth atetinna have been ordered from Ferranti for commercial teste this autum

IBM services now available from Scicon

IIIM users are now offered APL, PL/1, Cohol and Portran facilities by Scicon Cumputer Services. The well as interactive facilities. Milton Keynes bureau has installed an IBM 4341 operating under VM/CMS and VSI which can be accessed where possible via the network that serves Scicon's well-established and very extensive Univae 1100-based bureau opera-

well as interactive facilities.

The two-megabyte 4341 was originally intended to run the infoline information retrieval service on behalf of Pergamon Press. Pergamon bought Infoline from its previous owners, which included

the Department of Industry, after they had spent up to £600,000 o public money on an unsuccessful retrieval software development (CW, July 3). But the deal he-tween Scienn and Pergamon fell 10 Scicon, this was mainly because of Pergamon's tardiness in selecting new retrieval software.

March 11, 12 & 13, 1981 — Wembley Conference Centre, London

Have you booked in yet for **Britain's leading microcomputer event?**

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The desige of a universal microprocessor development system.
R Green, Riseasche Computer, Bystems, UK.
Chairman: David Dack, Hewlett Precision, UK.
Chocaling languages for resi-time embedded microprocessor systems
R Fourger, National Computing Cester, UK.
Developing FORTARI program suites for microcompulare
C Queres, Systems Dos., UK.
The GPM Copgaling a system.— The software bus O C Sees, Vice President, Usgarmann-Sees, USA

The QPIM obarating eyelem — the soltware bus D Powys-Lybde, MML Lid, UK

A C Grining, Bowinhorp Microsystems, UK Industrial Control Chairman Jos Gellacher, Microprocessor Systems Engineering, UK A paralist indoses soproach to machine tool control using a single

Optimize Borgyrer, propin compress on the Bell Null visually:
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Case Studies
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A microprocessor based assigner for intracts hal pressure r
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M J Teylor, University of Liverpool, UK
Cigital data handing of analosdy serodynamic phenomete
R Pescock O K Das. J Ford & C J Kelly, Craniteld Instituta
Tachnology, UK

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<u>Friday 13 March</u>

⊥Tel. No._

ALBO FORTRAN COBOLS BASIC 来 steinfreigne s'udv vo seden lius 米。 Rigar Computer Systems Ltd.

Systemic Property House, Criston Street, Bickington, Sussex, Bickington, Sussex, Bickington of Page 1961 (1964) Society of Page 1961 (1964) S

Shorthand speech translation

SUPERMICRO

only offic cause of inaccuracy with puter with 120K-bytes of main memory—40K for the translation software and the remainder for holding some of the weaklulary of \$5,000. English words with which the Palishtype syliables were matched. The system also used a 10-megabyte Winchester disc disc drive to store the vocabulary.

The Lapmenco machine was insked online to the Digital English ment PDP 1174 system that hosts Gerfax and the DEC machine in state of the subsides on to Certax page 270. The keyboard operator at expect Palantypis, was under stest atrees for main of the 20-minite speech, according to 801. During his address President States for main of the 20-minite speech, according to 801. During his address President States for main of the 20-minite speech, according to 801. During his address President States for main of the 20-minite speech, according to 801. During his address President States for main of the 20-minite speech, according to 801. During his address President States for main of the 20-minite speech, according to 801. During his address President States for main of the 20-minite speech, according to 801. During his address President States for main of the 20-minite speech, according to 801. During his address President States for main of the 20-minite speech, according to 801. During his address President States of the states of the 20-minite speech, according to 801. During his address President States of the 20-minite speech, according to 801. During his address President States of the 20-minite speech, according to 801. During his address President States of the 20-minite speech, according to 801. The 20-minite speech according to 801. The 20-minit

by Pamela Rowe

Hoskyns beats the recession

HOSKYNS GROUP, the company founded by John Hoskyns, now the Prime Minister's adviser the company's pre-tsx profits

off from R&D investment in improvement in previous years, but sn analysis of the company's pre-tsx profits

Unlike many other transports of the company's pre-tsx profits

now the Prime Minister's solviser on strategy, reports turnover for the year ended October, 1980 up nearly 50%, from £12,096,697 to £17,686,624. I'rofit is up from £643,000 pre-tax in 1978-79 to collision.

Unlike many other companies reporting recently, Feeney makes no formal complaint about higher

interest rates which have cost the company £103,000 this year,

worst of the recession appears to

ia now the scene of a major

confrontation between that com-pany and Japanese giant Fujitsu. Fujitsu has beaten ICL to the

post for a series of Australian pub-

lie authority apen tender

business is expected to move to Europe this year and the trading

results for the two companies io Australia last year clearly shaw

low the battle has gone.

First, the ICL results: For the

previous year. Turnover was up 28% to A\$67.5 million from just

under A\$50 million in 1979. Stan Owens, head of ICL's

A\$4,000,000 in 1978/79 and accumulated losses of A\$13,000,000

The company appears to have achieved a major breakthrough a)

THE results of ICL Australia and of Pujitsu's marketing subsidiary there, make sombre reading.

and the ICL 2900 series.

be over and Haskyns is going inta 1981 with one of the strongest

According to the company, the

ICL, Fujitsu fight

it out Down Under

Australian subsidiary's

The company appears to have achieved a major breakthrough a) the upper end of the market where it sold an Amdahl V7B to Esso to the upper end of the market where it sold an Amdahl V7B to Esso to the upper end of £21,600 per embedding fir the UK achieve. The median figure for computer companies in the UK achieve. The median figure for computer companies in the UK achieve. The median figure for computer companies in the UK achieve. The median figure for computer companies in the UK achieve. The median figure for computer companies in the UK achieve. The median figure for computer companies in the UK achieve. The median figure for computer companies in the UK achieve. The median figure for computer companies in the UK achieve. The median figure for computer companies in the UK achieve. The median figure for computer companies in the UK achieve.

COMPANY COMMENT

turn to profit was achieved despite

Owens abserved that the

strength af sterling had added ap-

gion. On this basis the Australian

machines worth a total of A\$9.5

gross sales per employee of A\$165,000. This is substantially

better than many companies operating in the UK achieve. The

against £20,000 last year.

fl,151,000. 1 doskyns, now part of Martin Marietta Data Systems, claims that much of the improvement is a payaf Hoskyns, attributes much af the CGS spreads its wings with big US consultancy

FRENCH software glant Cap
Gemini Sogeti has acquired a firm
footing in the US with the purchase of Milwaukee-based DASD
Corp. The mave follaws last
week's expansion into the Norwegian market with the acquirelying of

week's expansion into the Norwegian market with the acquisition of
Date Logic (CW, Jan 22).

At the same time CGS has broken off the long-standing licensing
agreement with the US software
products firm ADR so that it can
concentrate on its own products concentrate on its own product

Since the licence still had two years to run, ADR has acquired Cap Sogeti Products, part of the CGS group, as its outlet in France, to be called Applied Data Research. France. scarch, France.

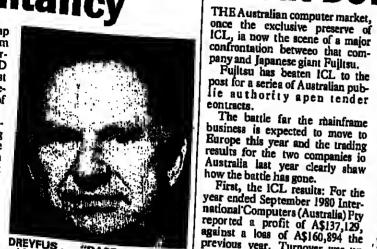
carch, France.

CGS results this year mean that the company can afford to grow, cspecially on foreign ground. "What DASD can give us is a wide network of branches in the US" explained CGS chairman Philippe Drayfus. "Also its business is essentially in the private sector." essentially in the private sector industry, banking and commerce - whereas our work in the US up to now has been in the public sec-

CGS already has an office in Washington of some 30 consul-tants concentrating on federal and

"It takes a long time to grow abroad when you are based on home ground" said Dreyfus, "Ag it is we now have a ready made force of 500. We could have waited 10 years to grow from 30-strong to

A new branch of Cap Sogeti Logiciel is opening in Boston to sell products.



DREYFUS . . . "DASD can give us a wide network of brenches in US."

\$900,000 the acquisition of DASD will provide a substantial addition to revenue and profit for the CGS

group.
With DASD, CAP Gemini acquires a range of software packages including program conversion software, one of DASD's software specialisations.

The particular packages are packages including program conversion software, one of DASD's software specialisations.

The particular packages are packages including program conversion software. The packages are packages including program conversion specialisations.

No price was quoted for the DASD acquisition, but about \$10 million would be in line with the FASCOM (Australia) Pty, the Pujitsu marketing subsidiary in Australia reported a 550% increase in turnover, from A\$8,000,000 in 1978/79 to A\$43,000,000 far price Seicon pald for System

The move away from ADR is linked with CGS wider ambitions.

"Por 10 years we bave been acting as a selection of the control of 1979/80. The company has moved into profit for the first time since setting up in Australia in 1972, with a modest A\$10,000 profit for 1979/80 against a loss of iog as a sales outlet for US pro-ducts" said Dreyfus, "and it means that we put a great deal of management and sales effort into selling produce that contributes little to our income, and nathing to our own technical development." mulated losses of A\$13,000,000 jance starting up.

The spectacular turnround was achieved primarily through the successful seelling of 21 of its medium-sized F model systems, the equivalent of the IBM 4300 and the ICL 2000 steples.

oglciel is opening in Boston to our own technical development."

DASD, one of the most pressiglous consultancy operations in the US was ranked second after IBM in a recent brand preference study conducted by Datamation.

The DASD Corp employs about for IBM-based mainframes, its automatic text composer A DOC the US was ranked second after computerised aid for the prosumer, SIP. Products include grammer, SIP. Products include for IBM-based mainframes, its automatic text composer A DOC trated on the Eastern scaboard and in themid-West.

With total revenues last year of \$22.5 million and profits of subset of PL/1.

Memorex tumbles

MBMOREX, which has reported manufacturing elements of losses of \$26 million on sales of Memorex into one single division of infinite for the first nine and cut the US sales force by 50% of infinite for infinite for the kind. He is also reported to have ground seven years ago.

According to industry commentators in the US, the best charge

Fascom bas increased its market share substantially primarily at the expense of ICI though obviously not without inflicting losses on IRM.

Although Fulltau likes to stress the facilities available on its machines, the real battle is based on price. For any given machine it is estimated that Fu-

Logabax hires 20 more dealers

WITH its French parent company just saved from bankruptey (CW, December 11, 1980) Logabax in the UK has unnounced that it is duthling its external sales network by hiring an additional 20 dealers. they will handle the firm's small

In reinforce its dealer network, Logabes is also setting up four dealer support tenus to cover the whole of the UK and the Irish

Republic.
The existing 15 deulers selling the Lagabax LX2000 small litisiness system and LX500 personni camputer accounted for almost 35% of Logebax's turnover for the products during 1980.

The rescue operation for Loge-bax in France has involved major injectians of cash, including about £12 million from Electrobel of Belgium, which has increased its controlling shere in the firm to

preciably ta product easts. However, the company ended the year with a record order book, ineluding the first 2966 sale.

In the consolidated report far the ICL group the Australian figures are hidden in the turnover for the Australasia and Asia region. On this basis the Australian Two other sources which heve already cantributed about £2½ million, end ere ceeh expected to add a similar amount in the spring, are the French netionalised bonks and the government investment

body, CIASI.
Another £2½ million is being operation contributes just under put in by the group set up early in 1980 in take over Logabax. The 50% of the turnover for an area which takes in New Zealand, Hong Kong, Malaysia, India, Singapore and agencies and dealers three members ore banking giont Société Générole, ovintium onglomerete Mercel Dassault, and Dassault's cumputer and electronics side, Intertechnique,

which leads the group.

After going off the idea of a Logabax ecquisition lete last year end so plunging the empany into crisis, intertechnique finally agreed,

Signal merger complete

Australia, Fascom also captured the plum of the Australian computer market last year when it sold to the Bureau of Statistics and Acros markings when a total of Acros MEMORY maker Ampex has completed its merger with Signol and is now a wholly-uwned sub-According to the company it sold its machines in 11 out of 17 open bids where the user changed had tutnover of \$4 hillion last year, compared with Ampex's \$459 milaupplier.
According to Mike Roydon,
Fascom managing director, the
company increased its staff over
the year from 150 to 260, giving

us a prerequisite for the plan, to pay £11 million by a h.5% holding in the malge and peripherals, managed lite one big condition in for this year than in [80].

liketrobel is keen to four its majurity interest in Land.
But se far, the reduction the Lungabax manufacturing the Lungabax manufacturing action in France seen as becoming the company the company. inipriive the company that heve not materialised. This presidential election on the months away the Frend per ment would be relocate by prove any cuts in the land workfarce.

According to Logabur and FP85 million cash injection the existing interested puts scheduled for April, bright total cantributed to the last rescue bid to about 130 min.

Prices will stay 'soft'

INTEL, the world't luc microprocesser chip products ennounced turnever for the ended December 31 up 2% to \$661 milling in 1979, to \$30 a lion in 1980. Profit rose 20 tr \$77 million to \$96 million.

In the fourth quarter there slight drop in profit cone With the earlier part of the year. Gordun E. Moore, the k chairmen, sald there was in. price decline in the second it the year, and he expects post-stay "soft" until the ressa-ends.

Profits doubled

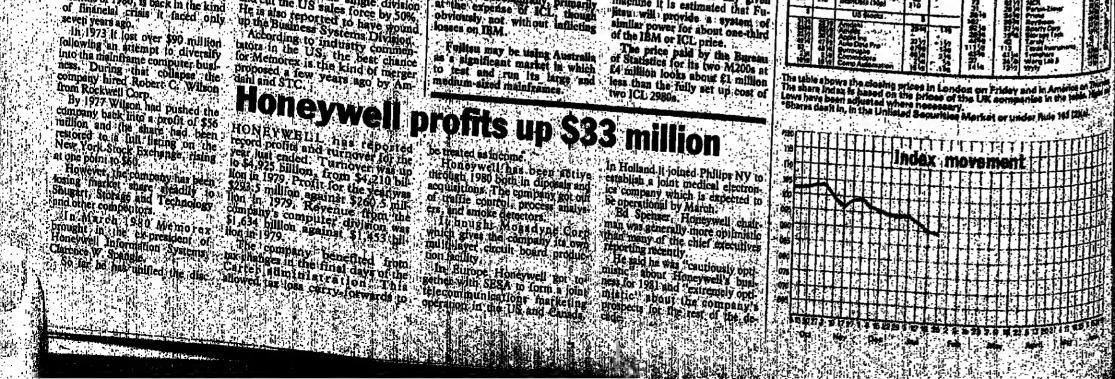
MINIDISC maker System in ries inc, which recently were lie in the US has revealed in quatter revenues for 1980 Mt. at \$9.9 million. Profit at disubled, from \$249,000.

CW SHARES TABLE

(9)		Escharge		Lauta			US Stocks	1	
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	1	Arrichi Acidez Apple ing Auto Date Pro** Dviroughe	2017	12		9	Confession of the Confession o		- 90 mm. a.s.

The table shows the closing prices in London on Fridey and in America of Binds. The share index is based on the prices of the LIK companies in the table light cover have been adjusted where necessary.

Share dealt in, in the United Separation Market or under full 1884.



PROGRAMMERS' PAGE

Computers find a role in films, music and art

form is not something that emps solids and grey scales, but also desup all the time in your average wide field and has ranged from mobiles made from paperelips to hieyele tracks across virgin paper. puter to the Cause is, dare I say it,

In the early enmouser days there were many claims of how machines could be programmed to compose symphonics, write heat-sellers. and even, given the tim)pertinent data, to out-Picasso the Cubists.

Results were disappointing, though. The sheer punderousness of the task, to program even an outline figure, was not realised, and styles were wooden and

The situation rodoy, just as foll of possibilities, is more realistic. with the computer used as the tool decreasing costs of hardware and increasingly easy-to-use software, computer art is booming among film-makers, composers, and art-

Arts Society

The Computer Arts Society was formed in 1968 as a specialist group within the British Computer Society. It aims to encourage the creative use of computers and has a worldwide membership of 600, with 300 in the UK and the remaioder divided about equally be-tween the US and the world. Besides the London branch in Russell Square there are two others, in Paris, and in Michigan. Secretary of CAS, John Lans

down explained to me that the major artistic contribution of the computer is 10 graphics and electronic music. Computer generated graphics are used extensively in animation, for films and commercials - lodeed, it has now beceme so expensive to produce hand-drawn carroons that 20% of all animation in the US is carried

Given enough money," he said, "any image can be synthe-sised."

One artist at present In the US is Teny Longson on a Bicentennial Arts fellowship in California. He has used computers in his worksince 1973 and specialises in threedimensional shapes made of images printed on layers of clear: perspex. As the viewer moves, the shapes change and evolve into dif-ferent forms - Longson describes them as "drawings in space."

He is also fascinated by pictures of planets, and his fellowship for-tunately takes him to the Jet Propulsion Laboratory in Pass ena. Here computera fabricate pictures, composed of an array of defined by colour, size, etd, and controlled in ine final image. Longson has had several exhibitions, including two in the US in 1979, and one last year in Oxford. Working in Britain, on a Science Working in Britain, on a Science Research grant at Leieester Polytechnic, are Ernest Edmonds and Stephen Scriveher. They have been experimenting with raster images which not only.

Puzzler

NO doubt you're looking for asmathing to work out on that new pooker calculator you had for Christmas— so try this one. The tesk is to identify the three different, digits involved. See page 45 for solution. X,YXZ = X*+ YY+X*+ Z

cribe the image as a matrix of noints, each with a particular value, that can be stored in a special section of mentory. Writing image, while reading allows

The plus factor of the matrix system is that the image maps the computer in effect "looks at" the image on the screen.

In the more conventional vector system the image is field as a list of vector points, so is only a representation of an absimer structure. The not have direct access to the image but must learn to manipulate the alistract in affect the representa-

Two of the graphics are illustrated, showing a man with and without his hat. The hat can be removed with an ERASE command, stured actually on the edge of the screen, and recuvered with a COPY. A cursor used in conjunc-tion with FILL would block in any desired part of him, and can be stopped when his flesh becomes

that bit too solid. Edmonds and Scrivener are now human and machine perceptions They aim to write procedures that will translate the perspective inherent in two-dimensional pictures, into new images, taking int account the figure/ground

Acceptable

perception and perspective is Dr Chria French of UMIST, Man-chester. He made a fairly lighthearted investigation into "whether computer art is a load o quasi-spherical objects," He was set rolling by an Alan Parkin article on computer plotting of illumi-nated balls, given details of size, position end direction of illumina-tion. Chris French bounced up one better by rewriting the routine in Fortran IV, and modifying the light to a point instead of a parallel source - it gives a more artistic

trated. The centre-piece shows a hells of balls turned around to expose the central tunnel; Bottom right, another double halix of balls is printed to overlap each other's positions in space.

Chris Freech believes that com-puters will take over from the apray-can and graffiti-covered wall, as the time honoured tool for expressing ereativity. They will soon be within the reach of everyone's pocket, he says, and are slightly more socially acceptable as

Harmonies -

part in two ways, it can be used to ald composition by controlling synthesis and barmonics, or as a device to produce sounds directly. Control is practised mostly in UK. and Europe, while production is more common in the US.

more common in the US.

The internationally known composer Xenakis produces clouds of anticipation in the by using the computer to calculate the probabilities of thermonics. Berno Amman, the putable Swiss conductor and composer, turned to electronic music in his Sixtles after a distinguished lifethne in music, and has collaborated with universities in Rurope and America.

Too right of the montage is

Top right of the montage it an excerpt from ills "Splendeurs Noctumes"; produced in 1975/76 using a PDP-15. Amman, by recourse to logarithms, generated 12 phases constituting the 12 steps of a "Principal Curve." Each phrase

piece culminates in five levels of snond descending from the high pitched communous tone of the Principal Corve, to the calmer

One of the most significant cnntributions to computer music has been made by the British-hased Electronic Music Studios. Besides arrying off the first prize in 1975 for the world's hest computer music program, with "Musys," they have a whole list of actievements dating back to 1967.

Musys is a series of programs designed to process snauds, dealing with scientific as well as musical aspects. It was written mainly in Fortran by Alan Sutcliffe, thuugh Peter Groguno wrote

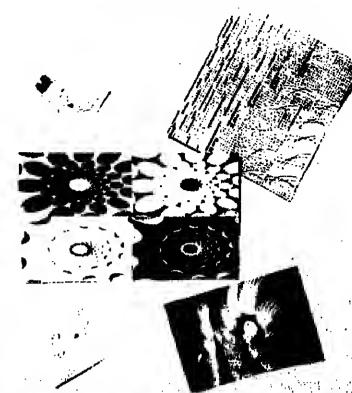
A forthcoming week of seminars and concerts on the theme of "The

with two sets of concerts and a prescutation of tape-works giving an overview of computer music.

To spread the word and forther zinc, Page, issued four times a year, and links meetings in Lan-don on the first Monday of each month. Membership, running from January to December, costs Each year CAS elects an

honorary life member, to mark outstanding services to creative computing. Last year it was Jumes Blinii, who produced the eninpu-Vnyager and the Jupiter Space

Computer art and music are settling in well. All that's needed



sequances, printout of data delined chains of balls, and part of electronic music score.

For around £20K, you could have any of the many 16-bit computers on the market.

For around £20K, you could have only one 32-bit computer. Ours.

Our new Concept/32 has two things in common with a 16-bit computer. It is roughly the same size and roughly the same price The rest of it is light years away.

Concept 32 philises all of the advantages: of our 32 range and offers substantial improvements which put it in a class of its own.

LSI chips, multiwire boards and the fact that it is compatible at source with the 32 series software means greater reliability and reduced programming and support costs. It can be. used with a wide

range of peripherals including a new floppy disc arive and a 32MB cartridge disc drive - and, being modular, can be easily



integrated as a component within a system or a

There is no 32-bit computer to touch it for price and compactness. There is no 16-bit 4: When you think about it, it can be the only

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How many ops are to the manner born?

- or did you just become one?

It may be misleading to put the alternative as starkly as that. After all you probably have the kind of abilities which suit the way you earo your money – and if you heven't it's time to evoid an olcer and collect your cards.

But which way does the balance tip? Is there something ingrained in you which particularly suits your woy of life, or did you stum-ble to your present eminence through your own efforts plus the movement of time and chance?

Nature or nurture

The conundrum of whether a person's fate is determined bynature or nurture has been a preoc-cupation ever since mankind first

Interviewers selecting the right bod for the right job doo't usually arbitrary. The value of an apritude test lies in its trustworthiness as a bave the time for such preoccupadons and cut through the philosophising. They want to know if the interviewee can do the job and then to predict the way the person in the chair is likely to behave.

For example, if a significant proportion of psychiatrists bappened to have an aptitude for leaping or idditional time. There are, of course, many ways for an employer to fill a vacancy, ranging from old boy networks to ever else you care to think of, then skill in leapfrogging or tiddiywinking would be acceptable predictors for aspiring shrinks. 'O' levels and wing a chair at the applicant as

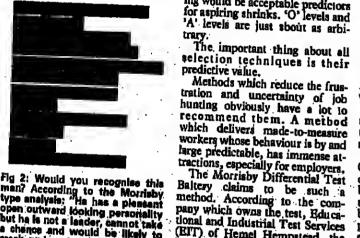


Fig 2: Would you recognise this man? According to the Morrisby type analysis: "He has a pleasant open outward looking personiality but he is not a leader, cannot take a change and would be likely to crack under strees. He lacks the specialised ability that anables film to ebsorb book knowledge and reproduce it in an exam."

be or she walks into the room. It's been done and is a method of judging how people react to a surprise. More definite than that, it's an infallible way of seeing how they'll behave when a chair is thrown at them.

Having determined the "structure" of a person, "it describes the mentality of the person in general terms so that inferences can be made, not only of the person's likelihood of auccess in a very understanding as distinct from the ability to learn by memory.

A more measured aid to Beleetion, favoured throughout DP, is the aptitude test. The sp-proach of such tests usually equates to the kind of things candidates will be doing, but the essence of the aptitude test is that, like the

Arbitrary

leapfrog or tiddlywinks or wbat-

'A' levels are just about as arbi-

Methods which reduce the frustration and uncertainty of job hunding obviously have a lot to recommend them. A method

workers whose behaviour is by and

(EIT) of Hemel Hempstead, the

test gives "a complete statement in objective terms of the intellectual

and model (personality) structure

large number of jobs, but also of his expected mode of bebeviour io

So, short of saying what colour shoes you'll be wearing on Wed-nesday, the test claims to predict

Fig 1: Completion of chains like this, which was originally orenge and purple, is the first part of the Morriaby Differential Tsat Battery.

"Il isn't just another aptitude test", says Brian Harrington. "It is a predictor." Harrington is cur-rently Data Base Administrator at

training and is a firm believer in its

took it before Christmas.

How does it work?

He administered the test when I

The entire battery of tests lasts for three and a ball hours with a

We sat at separate desks and

absorbing and enjoyable.

The first test, the co-called Compound Series Test, consisted of continuing strings of coloured beads, as illustrated in Fig 1. The subject has to choose which two beads, from eight, to continue the pattern. There are 60 such seem

pattern. There are 60 such sequ-

ences to complete and although the

first few are easy, the latter are all

Mary Morrisby, whose husband

devised the tests, says that not one

how an lodividual is likely to be-

Operators who have been suaded they are thickos should take heart from the essessment that a score of four on the Compound Series Test indicates sufficieot intellectual mettle to be a

EIT's sales handouts emphasise

a oumber of advantages for the

first test in the battery. Colour

weak individuals - those who are

not completely colour blind -

the colours bave been arranged to

isually bave no problems because

Most important, EIT has

trasped the nettle of cultural bias

and a dependence on socially acquired skills. The company even claims that the test can be used on "primitive people". Presumably

whole tribes can be lined ttp in their mud huts or huddled into a

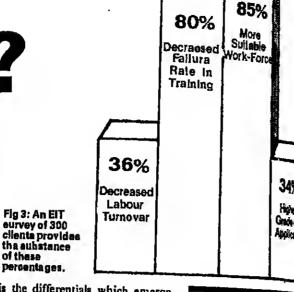
Pollowing the understanding memory test are three general abil-

matched trio determining suitabil-

Speed

As with the rest of the test, EIT does not encourage results of the

wadi to be tested.



of thase

is the differentials which emerge between akills and aptitudes. The relationship between results is drawn up to form a personality profile in the kind of histogram shown in Fig 2. The first section of the Murrisby

test is used to give an indication of ability or, to take the longuoge of astrologers, the head. The remoining tests are taken to indicate heart or drive and comprise a shapes test, a mechanical obility test and then a clutch of six speed tests. The speed tests ore supposed tu

define personality and dexterity.

The final histogram or profile is said to remain the same in its pattern throughnut a person's life.

Harrington urgues the test on to a scientific basis by saying: "In effect we're conducting an experiment. The criterion should be repeatable and if that is so, we have a predictor." Taking the line of thought to its conclusion he says:
"If we have a predictor it gives us

Explosive

hy tests covering verbal, numerical and perceptual aidils. Results from these are designed to be used as a Every effort is made to keep the criterion repeatable. The tester works in a script, and cootrol is kept at a maximum with each part of the test strictly limed. HIT in-

The issue of coolfol is explosive, as Harringtoo is quick to scknow-

the validity of the test must be

She continues: "Validity figures can be misleading because people tend to use precise techniques on linese data."

It is true that exhaustive assistical analysis is a large task, but the
pragmatic validity fest would
represent a total cop-out to an academic psychologist working to a
ughter frame of reference. The
data for such a validation check
mist be available because the test
was completed in 1955 and is ass
by something like 15,000 people
coery year.

Hire and fire

I WAS phoned last well gentlemen esking: "Her t does Compuler Week a.

A simple answer span Who wrote Beethorn's R

Where was the Battle at h ings? Who is the Queen Me

daughter? Who Is buried to Gran's What time does the 4.36

What do computer out?

Mary Morrisby says "Ik formation the test gives all which you'd find out siet dence ... flexibility

nacy" and so on. Although the histogram scientific, the language mil all the precision of a horonor.

I was told, for example was "more at home with her with practical matters". - but had I been told the open I would probably alique concurred. I would feel uneasy if I will ing hired or promoted on the life of this kind of information.

Rejection or acceptant of a sweeping techniques as the strict of the property of the property of the sweeping techniques as the strict of the property of the fined. Those are the two of the argument. The greater the trust plants

predictive technique, the the tendency to up the paire ture belance in favour di man. Do you determine you is your fate determined.

garden.

B. I. HYPHER, of Pool is has some more thought as notic tupe and the company

PEOPLE and EVENTS

Top appointment at Commodore

A PRESIDENT and chief operating officer has been appointed at Commodore. He is James Finke, who joins the company from Data General, where he national operations in the company's semiconductor division, he rose through the organisation to become vice-president and general manager of the communication division, European

Finke gained a physics degree from Williams College in 1951, and received a master's degree from Oxford Univer-Between 1974 and 1978, Finke became general manager of General Electric Medical Division's internasity in international economics. He also gained a law degree from Harvard Unitnitial responsibility in his new job

says Finke, will be in ensuring that Conmidere's marketing principles are applied effectively to "a promising US market." His career in the computer industry began in 1964 when he joined Motorola. Starting as director of inter-

Richard Emery has been appointed senior systems analyst at Microfin Systems. He was previously with John Lewis Partnership. Jane Collina has also inined the firm as marketing John Hutchissoo, former lecturer in computer science at Queen Mary Col-lege has been appointed company secretary at 21st Computer Systems. Another director appointed by the company is other companies to the company is also 10 years in the computer industry specialising in the development of high level language compilers, takes on responsibility for software development

Reg Broughton has been appointed national marketing manager at Wang UK. He juined the company three years agu and served must recently as field sales manager. Ulf Gustavsen has been appointed managing director of Nursk Data. He was formerly international marketing

Liveware File

Mike Burden, who was behind the launch of the Wordplex word prives-sing hureaux, is leaving the company to become managing director at Computer Ancillary Services Ltd (CAL).

... THAT CAN DANCE

ON THE POINT OF A

by Don

NEEDLE ...



Bruce Everiss (left), genetet manager of Microdigital, congratuletee John Bonnison of Birminghem on winning the compeny's £1,000 composition. Entrants were saked to put in order 12 reasone why people should buy from Microdigital. The competition were judged by Everiss and Dr Mertin Beer of Liverpool University. Bennison is a lecturar in dota processing at Werley College at Technology, Sendwell, West Midlande. Microdigital hes recently been taken over by the Lesky's chein and to opening micro departments within Lesky'e hi-fi shope, with leunches schedulad for the early part of this yes?.

Systems training head retires from Civil Service

FOLLOWING a 43-year categor in the Civil Service, Ceeil Marks is to retire at the end of this domin.

sington in 1957, and subsequently was responsible for the Prism Personnel Information System. For the last three

A founder member of the BCS, he was involved in setting up specialist groups, and was BCS president in 1975/76. In 1955 he joined a group of people working on electical mechanisation at NPL. He managed the first groupment 192 installation at Ches. in October 1982.

years he has been director of systems training at the Civit Service Follege.

The will continue his work with the BCS, particularly as co-ordinator for various projects the society is planning for its silver jubitee year, which begins

Prestel loses deputy director

ONE month after the confirmation of Prestel International as a permanent service. Prestel's ileputy director Mike Ford, who was in charge of the international side, has been promoted out of the Prestel organisation. He is now chairman of British Teleconi's Wales and The Murches Regional Board.

Alon Rick has been appointed direc-tor and general manager of Alimant Computer Systems, the was previously with CMC Computer Management Group for eight years as managing director of its specialist hanking ser-

Rogee Willink has joined I.P. Sharp associates as trained consultant. After-

garet Joachim has also joined the com-pany as API, consultant. She previously worked for BCK. Datasolve witting APL Software: Also joining Sharp as a consultant is Nicola Coyoe, who furmerly worked as a student for

Raymond Sparrow has joined Birtel as systems director of Itatel Business Systems. He was furmerly senior con-sultant with Logica's Middle East

Eric Sidebotham, managing direc-tur of PPD Engineering, has been elected chairman of the Control and

Roy Weaving has been appointed consultant at Systems Resources. He joins the company from Rockwell Thompson.

Some simple addition



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OLVII-J INTERFACE

11/23 CHASSIS

The important thing about all sbort break in the middle. I sat it with two other people one of whom was applying for a job at Berger, the other was already tration and uncertainty of job

recommend them. A method subserved 12 pencil and paper type which delivers made-to-measure tests. It was quite hard work, but

KDFII PROCESSOR 64KB MEMORY DLVII-J INTERFACE CHASSIS 8 x 4 32 MBYTE HARD DISK

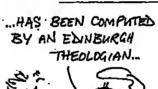
PRICE £7,860

Herrington says that at Berger the product for fare advance on the same of confee but that it does not have a say of the same of the same

IT HAD TO COME, I SUPPOSE - "THE NUMBER OF ANGELS.















DIARY

System X. BCS East Angliso-branch, Eastern Electricity Central Ac-counting Offices, Russell Road, Ips-wich. 7.00.

FEBRUARY3

Ada/Pascal. BCS Kent hranch.
Kings Head Hotel, High: Street, Rochester, 7,30.
Technical update - hardware. BCS
North West London. Railway Hotel,
Greenford, Middlesex, 7,45.

FEBRUARY 4
Visit to Artificial Intelligence De-partment, University of Edinburgh. BCS Edinburgh branch. 5.30.

Mainframe versus mini, BCS Ches-er and North Wales branch, Halfway House, Connak's Quay. 7:30.

Locat medical computing — the introduction of networking, BCS Dundee: branch. Ninewells Hospital and Medical School, Dundee, 7:00.

Ada processorates statement statement.

Ada programming support environ-ment. BCS North Staffs branch. Com-puter. Centre, North Staffs. Polytech-nic, Stafford, 8.00. FEBRUARY 9

Visit to Rohinson's Brewery. BCS
Manchester hranch. Unicom Brewery,
Lower Hillgate. Stockport. 6.15. Apply to A. Park on (061) 872 2494.

Visit to Brinish Rail Technical
Centre, Derby. BCS Process Control
Group. Numbers limited, so apply to
Peter Andow, Chemical Engineering
Dept., Loughborough University,
Loughborough, Leicesterthire.

FEBRUARY 10

Microprocessors — the State of the

Microprocessors — the State of the Art. IDPM. Hull branch. Hull Crest Hotel, Ferriby High Road, North Farriby, North Humberside. 7.15.

Will tomorrow's office be an office? BCS Reading branch. Small Physics Lectura Theatre, IJ Thompson Building, Whiteknights, Shinfield Road, Reading: 8.00.

KEBRUARY 11

The Cray system. BCS Bristol

The Cray system. BCS Bristol branch, St Vinceni Rocks Hotel, Cliftoo. 7.15. too. 7.15.
Organisation and operation of a DP ares. BCS Hampshire branchi. Postamouth Polytechnic, Postamouth.

The office of the future — beyond word processing. BCS Klogslon-upon-Thames branch, Room 140 Kingston Polytechnic, Penrhya Road, Kingston 7.30,
Computers in banking, BCS Newcastle upon Type hranch Billson Bullding, Newcastle Polytechnic. 6.00;

FEBRUARY 10

The Electronic Office, BCS Merseyside branch, Faculty of Science Lecture Theatre, Liverpool University
6.00.

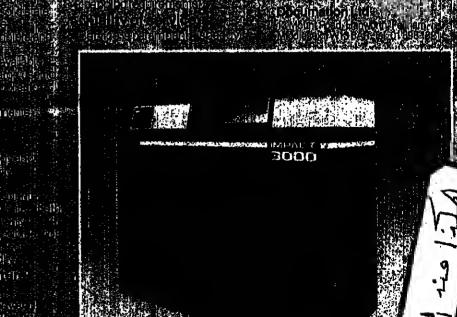
Planned maintenance of factory
plant, BCS Elemingham branch in the services and Prestel Communications
Wheatshear Hotel, Coventry Road,
Sheidon, 6.30.

Computer aided design at Fords.

BCS North London branch. West
Lodge Park Hotel, Cockfoaters, Lombranch and Insurance Institute of
Chelmsford, Datel Communications
services and Prestel Communications
Sheidon, 6.30.

Whither Cobol? BCS Tecsside
branch. Tessfide Polytechnic, Borough Road, Middlesbrough, Cleveland, 7.00.





(国际公司制造的联合中国国际) The state of the s TURBUILDE TERMENTE

LOW COST 11/23

ROSEMOUNT TOWER, STAFFORD ROAD, WALLINGTON, SURREY SME BRW.

ARROW COMPUTER SYSTEMS LTD

lty to one career or aoother. For example a "blological science profile" shows a person to be "sulted to medicine, dentistry, some types of nursing, zoology and agriculture".

sists that before anyone is alluwed to administer the test, they must sitend a five-day training course. If a test like this is accepted as a predictor then, says Harrington, it gives us significant control.

ledge. "What we have here," he says, "is a loaded guo."
However, before anyone gets hot under the coller shoul control, the validity of the test must be

Validity in this case is a two-specied animal. There is academic validity based on statistics and close scrutiny, and the rule of thumb "I've-scen-it-work" kind of

Mary Morrisby, a psychologist by training, knows that the "prob-lem of getting statistical figures is great"

The only validation work re-ferred to in the brochures describ-ing the tests is summed up in Fig 3. The histogram is "based on the findings of 300 industrial organisa-tions"

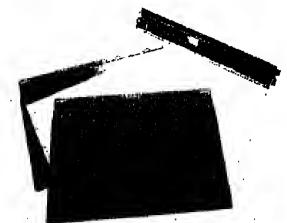
dener.

He says: "After the life says: "Afte

by Claire Gooding

1981 Wrunt Line Squash Tournament

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ooking — close cartridge and lock with finger-tip



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[1] 1537 王字3**3** |



-DRAW FOR ROUND ONE-

Round ONE must be pleyed between 1st Fabruary and 31at March

Round TWO must be played between 1st May and 15th June 1981 Round THREE must be played between 1st and 31st July 1981 Round THREE must be played between 1st and 31st July 1981
Round FOUR must be played between 15th Sept. and 15th Oct. 1981
Round FIVE must be played between 1st end 10th Nov. 1981
Round SIX must be played between 20th and 30th Nov. 1981
OUARTER-FINALS must be played between 7th end
15th Dec. 1981
Note: All the above dates are inclusive.

The SEMI-FINALS and FINAL will be played in London on 15th and 16th January 1982. The draw for the SECOND ROUND will be published in April.
The draw for the THIRD ROUND will be published towerde the

The draw for the UNIND ROUND ONWARD will be published.
The draw for the FOURTH ROUND ONWARD will be published saily in September.
The response to the 1981 Wright Line Squash Tournament has been so great that the Carter-Parratt Group decided to walve the original limitation of 256 teams. However, entries had to be exclosed on 31st December 1980 which was the published final

All: players and supporters are Wished good sport and good luck the The Wilght Line Division of ... Carter-Rarrett Group:
Vielreden House, Kimpton Boad, Sc.; John
Sürrey 3 4 a D. Tel: 01 4 4385. Telex: 943959

TOURNAMENT

SOFTWARE FILE

Product to eliminate the 'Ooops' factor CICS performance

ager, BGS Systems of Waltham, Massachusetts, believes there is a gap - now plugged by

its newly released product Crystal.

Crystal is aimed at eliminating what BGS calls the "Ooops" factor - that period during the project where everything is rescheduled because there have been miscslculations about such elements as response time. This can lead to long delays while more equipment is ordered, and programs redesigned or the predictions made by Crystal become corre-

interfaces and an limiting uptions

that in the US would land it in
front of a Grand Jury in an anu-

So said Sid Green, managing director of Southampton's rspidly expanding systems house Gresham

Computer Services, which is deter-mined to give ICL customers more options than they are used to when

He emphasised to his audience - who had come along for a demonstration of Greaham's

TP2900 teleprocessing support

package — that he did not want to cross swords with ICL as other ICL-compatible systems houses have been known to do.

TP2900 has been developed us-ing ICL's own standard software. It provides a powerful raoge of facilities which are very much

geared towards the end user, giv-

ng him extra options which are

aimed at ironing out those small but infuristing snarl-ups that eat up time to the operations room.

users can redirect resources when necessary, such as buffering out-

Getting close

SYSTEM 2000/80, Intel'a multi-user facility for use with the VM/CMS operating system, is close to relegae, having passed site-teating at a client installa-tion. System 2000 is almed parti-

cularly at the IBM 4300 market, to provide support to an online production environment.

Attention to detail means that

ing a performance model to he run through another performance evaluation psekage, BEST/1. The model is built in estimates of software structure and sets out to estimate res-ponse times, workloads, CPU and I/O time, and memory requirements.

Initially the estimates are mugh, but, says BGS, still enough of a guide to point nut the

costs £10,000, plus individual subsystems (£1,500-£1,600 is

quoted for a typical system).

Gresham installs the ayatem i

three days, with two weeks'
"lisnd-holding" and provides a

comprehensive support service

which costs £150 per month, per site, after the first year.

'More TP options

working from a set of tables in core

which are used to define parame-

ters for the handling of messages

and replies.

The aystem is grouped into control functions (such features as message logging snd privacy control), application functions (message editing/vslidation file access and failure handling), security and recovery functions, and aupport functions, including online management and development side which allow supervision and

aids which allow supervision and

TP2900 interfaces with the Total or IDMS databases. There was particular interest shown in

the security, support and mainten-

Head of management services at Lancing Bsgnall, Steve Dowling, gave a user's opinion of TP2900.

The development aids have

played a large part for Laneing Bagnall which is lo the forklift truck business, and has its systems development team working flat out to get them ready for when the brakes come off the economy.

Dowling admitted that online nalotenance could be a double-

edged sword, and also that it was necessary to have one central per-son whose main function was controlling the TP functions.

Given that, he felt that the speed of development and operational performance more than justified the decision to trust Gresham.

Gresham emphasises that users should adjust to VME/B or VME/K methods before consid-

standardisation of programs.

for ICL clients'

The input required by Crystel is a descrip-tion of the proposed application, its anticipated workload, and the hardware on which it is to

BGS, which specialises in performance measurement, provides two other performance produets: the interactive performance prediction tool BEST 1 and the interface with IBM's RMF/SMF which processes measurement data.

Crystal, which is said to execute on any system supporting ANSI Fortran IV, will be evailable from Fehruary, for \$17,600.

£2,000 + VAT.

For patients in intensive care

monitor for DOS/VS

been released by the Candle Corpin California. OMEGAMON CICS is a real time munitor which ains to make up for the scarcity of CtCS tuning experts by winkling out problems in response times, lockoms and system resources.

Candle says that Omegation can be installed in 20 minutes or less, needing "no books or authorised

on a CRT which can be used as a UICS transaction or on a dedicated 3270, which is not subject to CICS

An introductory price of \$4,900 to DOS VS users of CICS; the nor-mal price is \$7,500, and the pro-duct is available on trial for \$100. The first deliveries are scheduled

'Swap shop' offers compiler for Forth micro language

MEDICAL software specialist
Medicom has released a tool for
the Commodore Pci which enables nursea to monitor fluid
levels of patients in Intensive
care. The fluid monitor can
hondle two patients of once.
The system includes a digitaler NON-PROFIT making urganion any 380% system regardless of sation which exists to provide a "swap shop" for owners of 380Z Research Machines is offering a The system includes a digitiser pad which gives a record of the various levels printed, displayed compiler for the expandable micro

language Forth.

The Forth compiler includes all the low-resolution graphics routines and debugging facilities, and comes with a comprehensive or in graph form.
Including digitiser pad, essette deck and software it costs

the Research Machines User

Group, is setting up a l'orth sec-tion of RMLug, and can supply the t'orth compiler for £100. RMLug exists partly to distri-hute programs written by indi-

IBM can't sell you the best programming language for the 4300 series. At any price.

It's called INFO - a very high-level language, already in use in hundreds of Installations worldwide.

DP managers, programmers and accountants all agree this versatile language is the best software with VM/CMS, and -shortly -DOS/VSE: Prime, Honeywell Level 6 and DEC VAX.

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 ◆ Data Entry Data update

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Name of comparior team(s)

Telephone No.

Signature of Of manager or requivalent authority

As with previous Computastars, individual talent will be given recognition and to provide flexibility within the competition at regional heats and finals, events may

First UK heat will be for the Midlands region in Birmingham on April 25. The Southern heat will be held in Barnet on May 16 and the Marth area in May 16 and the North gets its tum in Cleckheston on June 6.

Finals will be in July at a date and venue yet to be announced. European finals, in which the top

Companies may enter one men's or one women's team or both, although additional teams may be entered in other regional heats. Acceptance of teams per region will be limited to 35 teams per

heat, so it'a first come, first served. Closing date for entries is February 28 and the entry fee is £25

At the foot of the page there are two entry forms. The first is for Computastars, the second for this year's apecial tug-of-war event. Computastars is sponsored by Computer Weekly and Wright Air Conditioning.

DON'T CALL US

COMPUTASTARS is a popular event and consequently attracts many enquiries. If you have a query, please don't contact us at Computer Weekly — get in touch with the staff at Computastars, 117b High Street, Croydon, Telephone 01-

Only the strong need apply

By way of a change, an additional competition is being held this year, the Computatug. An opportunity individual can be a member of the the Computating. An opportunity to prove superstrength, this tug-of-war is open both to teams of five men and teams of five women, but not to those competing in Compu-tastars teams. Cost is £5 per team.

team entry - but the event will be strenuous, so the organisers do not recommend it! Same rules and eligibity regulations as for the main

We have read and accept the conditions of entry for the Computastars 1981 competition and would like to entermen's The unit would like to compete in the following region: NORTH (Cleckheaton) MIDLANDS (Birmingham) SOUTH (Barnet).

In all matters relating to the rules or conditions of entry the decision of the organisers is final.

Please send entry form and entry fees to COMPUTATSTARS, 117b High Street, Croydon CR0 1QG. Tel: 01-688 6690

We have read and accept the conditions of entry for the Computating 1981 competition and would like to enter men's Name of team/individual

Stil our

Position held

The unit would like to compete the true pullwing region NORTH (Cleckhearon) MIDLANDS (Birmingham) SOUTH (Barnet).

Pleast circle appropriate region

Englissed is

to cover the enry/less for the seam(s) schequest payable to COMPUTASTARS LTD.

Places sent saluration the rules of continuous of entry the decision of the organisery is final!

Places sent salury form and earry sees to COMPUTATSTARS 117b High Street, Cabydon CR0-LOG Tell 01-488-6694.

Additional of the continuous of the continuous of the organisery is final!





Johan Brouwer, of Digital Equipment, damonstrates his skill in the fontball dribbiling relevet last year's Computantars.

Ground rules of the competition

TEAMS will consist of not less not take part in the remainder of than three and not more than five the competition. This rule will also

people. Each team is required to the team, compete for the indi-vidual title.

The competition will be run in two sections - men and women. Teams will compete in regional preliminary heats.

The wirning teams from each region will be invited to participate in the national finals. The top three men's and wonten's teams from the national finals will be Invited to participate in European finals in Holland in September.

Bach team must provide marshal - not a team member who may be required in assist in the smooth running of the competition. Failure to provide a marshal for each round in which a team competes will result in penalty points being deducted.

In each event in each round three members of the team will compete - the nominated No. I and any two of the remaining team members selected by the team captain. Team captains must be a member of the team, and with regard to team selection etc, the organisers will oply recognise the team captain's selection.

Should the No. 1 be unable to

compete after being nominated, then the team captain will nominate a substitute from the remaining team members. If the substitute for a No. I is used after the competition has started, then neither the original No. 1 nor the substitute is eligible for the individual title. yidual title.

If a No, I is substituted he t

apply to the nominated substitute.

Failure to comply with the nominate a No. I competitor who will, as well as being a member of aubstitution will result to be a substitution will result to be mediate disqualification,

The competition will normally consist of eight events. These will be selected from the following types of events, which apply to both men and women.

l. Running events - any distance up to a maximum of 800 i yards per individual and may include hurdles, 2. Throwing events - with r

range from a cricket/hockey ball up to a competition weight shot. Basket or netball type skills may be included within this category. 3. Kicking events - 105

number of categories which demonstrate foot co-ordination and skill, larget shooting, penal-ties, dribbling, rugby drop kicks, hockey-style events.

4. Gymnastics — short, shapp

and usually somewhat tiring. In the running event teams may be required to run a relay. Run-ning order will be at the discretion

of the team captain. In the case of a dispute the team captain and only the team captain will have the responsibility of re-

Presenting his team.

Tie breaking, In the team com-No. I will determine the team

In the individual competition, the best effort in the last event will determine the individual place. At all meetings the meeting rele-ree's decision will be final and not

Eligibility for events

ONLY personnel who are fully costed to data processing activities are eligible for Computastars.

are eligible for Computastars.

Only personnel who are employed by their present company prior to February I, 1981 cao represent that company.

Should a competitor leave the employment of the company they represent then they will no longer be eligible to represent that company after the date of leaving the company.

pany after the date of leaving the company.
Companies may enter one men's of one women's team or both. In each heat. Additional chrises of one men's/women's teams may be made in other regional heats.

Teams imp consist of members of a company if awn from different together.

Contract staff may be used aublect to the qualifying condi-

Once a person has been nominated for a specific team, they may not represent any other team. in the competition.

Once a team, entry has been accepted there will be no relund to the safety fee.

the entry fee. All costs incurred by teams are the responsibility of the teams.

the responsibility of the teams or one men's All competitors, participate at or both, in their own risk and the organism do not accept any disponsibility for any injury or loss of personal or company property.

All entries must be signed by the middlerent data processing, manager or an aquivalent signority.

How to trap the electronic spy

size from its original 128 bits to 56.

the NSA did not want a publicly-

available ende that it could not

break. Critics asserted that the

NSA could eavesdrop on commer-

cial transactions if it so chose by reducing the DES key size. Puelling suspicions even

further, the security agency also asked IBM to classify its working notes on the algorithm. IBM had

inadvertently reinvented techni-

ques similar to those used by the agency in developing its own algo-

The controversy became so in-

tense that the Senate Select Com-nittee on Intelligence held hear-ings, concluding that the NSA did

not tamper with the algorithm de-

sign and that IBM had agreed that

cryption could be broken quickly

256 keys, but that a million chips could search them in one day.

Public key

Professor Hellman is also con-

oerned'about possible "trap-

doors" in the DES algorithm which would allow IBM and NSA

for instance, to break the standard

in indutes using a mini.
IBM's Tuchman diamisses the

This gave rise to the charge that

Fears of electronic spying and high-technology

fraud techniques have grown apace in the

United States side by side with the de-

networks, concern is growing in espionage in the form of wiretaps and unauthorised database access from remote terminals.

Computer-related fraud already accounts for losses estimated at \$2,000 million a year, a figure that is expected to rise dramatically as more systems go online.

As the stakes are rising, wiretap ping is becoming easier and became a Federal standard on July cheaper. Alsn, since the wiretaps can be operated remotely, today's Before adopting the stundard, NBS ran it by the National Secureavesdroppers are less likely to get ity Agency (NSA), which is responsible for code making and breaking operations in the United

Further, since information may he stulen withmu being removed, the theft can go unnoticed so the information leak can continue in-States and the security agency persuaded IBM to reduce the key

imder who gains access to a database may not steal the inforntation but simply change it. The firm then operates unknowingly with false data.

Key control

In the face of this increasing vulnerability, users have a new tool for protection against unwanted

It takes the form of a data cucryption standard which defines an algorithm, or set of procedures, for enciphering data before transmis-sion and deciphering the received

messages.
To guard against unauthorised access, data may also be stored in encrypted form. While the socalled Data Encryption Standard, DES opplies only to US govern-ment agencies, it is also becoming a de facto private sector standard.

The DES algorithm is used for

encryption in combination with a secret 56-bit key to encipher databy using many parallel chips to teat all possible key combinations.

Professor Hellman points out that a single chip searching one key per microsecond would take about a million days to exhaust all involves a series of manipulations involving transposition and substi-tution of individual bits under key control, the process being inverted to decipher the message at the recciving end.

Algorithm and key are anal

ogous to an electronic combination lock, where the algorithm is the mechanism and the key is the combination that locks and unlocks it.

Even if the mechanism design is known, a combination lock cannot he opened unless one has the coinbination. Similarly, even though the DES algorithm is public knowledge, encrypted data is secure while the key remains secret.

Critical note

Users derive many benefits from the DES standard, it gives them a valuable yardstick to evaluate data encryption equipment and the standard permits mass production economies for semiconductor firma which can thus implement the DES algorithm in reasonably-

Even so, there are a number of is inadequate and will only be use keys are known but decryption ful for the next five years, since by then advances in large scale integrity in the computer science will including the control of the property of the control of the

then advances in large-scale integration and computer science will make it possible to break a DES encryption easily. Others question the circumstances surrounding the adoption of the standard, which involved some behind-the-scenes manoeuvring by IBM and the US. National Security Agency.

DES history dates back to 1973 when the US National Burdent of Standards (NBS) requested the submission of data encryption algorithms for consideration is an algorithm developed by submitting an algorithm developed by Walter Tuchnian and Carl Meyer of its Communications Systems de velopment laboratory to Kingston, New York, NBS bublished the pl. 1 Since the locking combination is gorithm in March, 1975, and it up lifformation in it, but only the

nations, the first used to lock the box and the second to unlock it.
Since the locking combination is public knowledge anyone can lock up information in it, but only the

velopment of the computer industry. MORRIS EDWARDS examines the US governmentbacked Data Encryption Standard (DES), designed to counter this trend.

> retrieve the messages. Similarly, public key cryptosystems could be used to protect against lorging messages by anthenticating a digital signature. The enciphering key would be

> While IBM's Tuchman acknowledges that the public key algorithm has merits, he warns that it must be researched, tested and va-

> > MIN HE REL

01 897 2434

person for whom the information is intended could unlock the box to

kept secret in this case and the

deciphering key made public enabling anyone to validate the signalidated before it can he considered

eriously for general use. In the meantime, the 1058 algorithin is meeting the cryptographer's acid test: it has been attacked for a munher of years by experts in the field and they have not been able to show how to break . Several manufacturers have implemented the DES algorithm in .SI chips and software implemeniatious are also available.

In hardware a DES unit takes about six inicroseconds to encrypt or decrypt one 64-hit data block.

It takes about six interoseconds to had a key or to load or unload either plain or enciphered text, repicul software execution time running from 30 to 100 milli-

While the mass-production eco-nomies of LSI circultry may bring DES chips closer to the \$50 range. a stand-alone encryption device may cost \$3,Jkto or more because of additional circuitry and the programining needed to support a number of terminals and operating

COMPUTER WEEKLY, January 29, 1981

So hate it is - the enlution to all nur electronic espinnege

adequate. Even so, controveray peraists about the DES. One opponent, Martin E. Hellman, of Stanford University, claims that DES enpossibility of secret trap-doors, saying that they would be detected easily by NBS. He also notes that If the 56-bit key were considered, inadequate for an application, one obvious so-When budgets are tight lor an application, one or vious so-lution would be to encrypt lwice for a total key length of 112 bits. Tuchman estimates, that the power needed to exhaust a 112-bit key would employ all the energy in the United States for 600 years. He looks, apple avolutably on another suggestion by Hellmans, namely, using a "oublic key"

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February 3-6

THE peripherals business is immensely convoluted and original sources of design and manufacture often defy analysis. For all the complexity, it is undeniable that the Americans are still the predominant manufacturing force in the design and manufacture of the series can be interfaced with most storage devices for nffline design and manufacturing force in the design and manufacture of the series can be interfaced with most storage devices for nffline devices for nffline design and manufacture of the series can be interfaced with most storage devices for nffline minant manufacturing force in the data entry, text editing and word UK market. A stroll around the processi Computer Peripherals Exhibition at the US Enibassy will confirm

According to Roger McCauley, director of the US International Marketing Centre, "The UK marketing Centre," suppliers continuing to meet ap-proximately 60% of this demand."

The figure of \$3 billion may strack at wishful thinking, but there are certainly nich pickings to

Products from 43 US manufac-turers are going on display including electrostotic printers and plot-ters, floppy disc drives, VDUs and word processing systems. The two Sintroms — Ellinor and Electron-

The exhibition, which is being held at the Embassy for the first time, is open from 9.30 until 5.30 on February 3, 4 and 5 and it closes an hour earlier on the Pri-

listed all the manufacturers in pages with total flappy disc alphabetical order plus their UK

ABLE COMPUTER TECH-

trom Electronies (R. Lloyd) A range of PDP-11 enhance-A range of PDP-11 enhancements on display will include the Quiverter, a dual purpose hus converter which allows the LS1-11 Q bus to access Unibus compatible devices or the PDP-11 Unibus to access LSI-11 compatible devices. The Quadrasyne/B and Quadrasyne/C – four line DLII-C equivalents which provide an interface between the PDP-11 Unibus and four asynchronous communication four asynchronous communication channels, will be shown,

APPLIED DIGITAL DATA SYSTEMS

rerminai Display Systems

ing front a law-cost dumh teletype to intelligent buffered terminals. The company's manufacturing yourme exceeds 5,000 units per month ond the displays are installed throughout commerce ond industry willt a high percen-tage going to the OEM market. BELLCOM

processor with a keyboard, similar to the IBM Selectrix with an equal ics - between them represent print quality and a large display nearly a quarter of die manufacturpy/input correction, while simultaneously printing nut unrelated documentation. The device locates/replaces words hundreds of times in seconds. Copy can run through the display backwards or forwards at nine speeds and a display memory holds up to 25 memory taking over 200 pages.

Control Data (C. Keihley)

Control Data (C. Reiniey)
CP 81 provides the venue for the
UK launch of the Finch fixed
eight-inch rigid disc drive. Also on
display is the Finch 9401, another
mamber of Control Data's range of member of Control Data's range of storage devices and the Lark -9455 eight-inch disc drive (8-megabyte removable and 8 megabyte fixed disc) which uses an SMD interface. Semiconductor memories including a range of DEC-compatible products are also

DATA DEVICES INTERNA-

PLESSEY

CENTRE OF

PHONE TO BAY FOR A QUETE

LESCEY

FIRST HER SYSTEMS

THE PHONE 1880 AND THE PHONE 1880 AN

DERIDHERAL

centry and output needs. They In- selection of tape reels prior to tape DATUM

to reach \$3bn by 1982

DATARAM

Sintrom Ellinor (J. H. Ellinor)
On diaplay is the LSI-11 with
compatible chassis, memories,
controller and micro. Festures in-Clude a 514, eight slot chassis (24 amps on 5 volt supply); DEC LSI-11/2 mlcrocomputer; DR-1155 dual board; semiconductor ADD-IN; DR-115 quad board, core ADD-1N; RF-11/RF-05 compati-

ble cartridge disc controller and TM11/TU10 compatible magnetic DATAROYAL

Facit-Addo (J. McDonald) Models 4525 and 4526 matrix printers are low-cost matrix prin-ters that print bi-directionally at

is a matrix printer operating at 150-200 cbps. Its microprocessor control simplifies the unit into four modules with the keyboard built Maxidek magnetic tape transport handles both NRZ and PE tapes at 45 lps. It is supplied with dualstandard microprocessor formatter embedded into the transport

PAUL FISHER PREVIEWS THE COMPUTER

UK market predicted

PERIPHERALS EXHIBITION

DIGITAL EQUIPMENT
Digital Equipment (D. Poole)
Numbered among products on
display is the PDT 11/150 intelligent terminal. The two box enclosure contains a microprocessor with up to 32K words of RAM memory and twin 1/4 megabyte floppy discs. The terminal can be a VT100 video or a LA120-GA 120 chps printing terminal. Also fea-turing the LA120-RA terminal, the LA34-AA terminal and the PDT 151.

On show is the Durango F-85. into the printer. The 1749 This is an all-in-one system comprising a processor, display screen, storage discs and printer. In addition, there is a word processing option consisting of a display screen, character printer and an extended storage facility including a 12-megabyte Winchester disc

FLOATING POINT SYSTEMS

Scanlan)
Scanlan
Peatured on this stand is a range
Featured on this stand is a range of array processors for high speed scientific praceasing. These models can be attached to all major mini and mainframe computer systems. Benefits include onalysis of data in seismic exploration; colculation, reconstruction and cn-



AGILE Syecote (J. A. Robson)

15G Data Sales (K. Osborne)

Peaturing the new 4200 series which reduces read/write errors and output needs. They in sales the new 4200 series which reduces read/write errors and output needs. They in sales the new 4200 series which reduces read/write errors and output needs. They in sales the new 4200 series which reduces read/write errors and output needs. They in sales the new 4200 series which reduces read/write errors and output needs. They in sales the new 4200 series which reduces read/write errors and output needs. They in sales the new 4200 series which reduces read/write errors and output needs. They in sales the new 4200 series which reduces read/write errors and output needs. They in the new 4200 series which reduces read/write errors and output needs.

Presented on this stand are a formatted D451, 45ips, dual density magnetic tape drive; a CDC30 megabyte storage module and a tange of embedded computer perlipherals including the TM/11 PDP 11 magnetic tape controller; PDP 11 storage module controller; PDP 11 disc cartridge controller; LSI 11 magnetic tape controller; IBM Series I magnetic tape controller with UVA Board; IBM Series I line printer controller; Nova magnetic tape controller and the Nova disc castridge controller.

CSPI
Buro Riectronic Instruments (M. Dalley)
The Map series of array processors, when interfaced to virtually any mind or supermind computer improves computational speeds by several orders of magnitude. Map offers multibus architecture allowing completely overlapped. I/O: aritimetic processing and control non-interleased memory artificial populating direct addressing of bytes, 16-bit half words; \$2-bit full words and 64-bit double-precision words.

DIGLDATA
Dig. Data (D. W. Holland)
Banibited here for the first time
is the 2516 printing terminal which

DIGITECH DATA INDUST

Johnson)

The Pacer which will be featured at the exhibition is a diagnostic system with two sets of functions. As a passive data line monitor, it provides a window to the traffic at the RS232 interface.

As an active desire it provides As an active device, it provides a interactive idiagnostic by simulating a terminal, CPU or modem.

Also un display is the Encore 100 teleprocessing diagnostic system. teleprocessing diagnostic system and the Data Monitor 200, for mo-

DISTRIBUTED COMPUTER HEWLETT PACKARD

System manufacturers

DOCUMATION

Documation (J.A. Oabaldeston)

The DOC TPS-3000 is an offline ampiact printing system which
offers a compact alternative to users wishing to release their mainframes for more important useks.

Configuration consists of a
microprocessor driver control unit
and a 3000 impact line printer
Also on display is the Impact 1400
series offering throughput speeds
of 1000, 1200 and 1450 imm, using
a 48 character set at six lines per
inch. Power supply and control
logic are built into the prints.

lite and selsmic) and the conversion of apeech aignals to compressed digital data.

ISG Data Systems (K. Osborne)
The 2300 range of Universal mierocomputer development systems comprises at and alone or multi-user systems capable of supporting the most popular 8 and 16 blt microprocessors. The company makes test equipment for all stages of electronic equipment de-velopment including original de-sign, production testing and field

Sintrom Electronics (R. Loyd)

Featured on this stand is an industrial quality multibus development/conirol system. The DCS-80, including dual eight inch plane and power supply, fits in a standard 10.5 inch rack space. It provides an alternative to OBM system manufacturers.

DOCUMATION

Documation (J. A. Osbaldeston)

Sintrom Electronics (R. Loyd)

Both the 2621A and 2621P ierminals are for interactive applications. The 2621F with an integral thermal printer combines the convenience of local hard copy with the speed of a video terminal. The main points of the 2621 are high resolution CRT display two full pages (45 inches) of memory; a maximum 120 chaps print speed 68-key, typewriter-style, detached keyboard and character mode edit.

HOUSTON INSTRUMENT
Sintrom Electronics (R. Lloyd)
Digitisem and plotters on exhibition include Hi-Pad and Hi-Plot Hi-Pad is an input device converting graphic information into digital values with user selection of various operating parameters in

hancement of images (X-ray, satel-

keyboard and character mode edit-

ing graphic information into diginal values with user selection of
various operating parameters by
interface logic signals (jumpers).

Among these is a choice of English
or Melric scaling data format (binary/HCD/ASCI) and resolution
of differ I, 005 of 0.01, various operating parameters by interface logic signals (jumpers). Among these is echoice of English or Metric scaling, dans format (binary/HCD/ASCI) and resolution

INTERFACE MECHANISMS
Sintrom Ellinor (J. H. Ellinor)
The Model 8220 bar code par ter is an electronically-controlled

IMAGE RESOURCE
Sintrom Electronics (R. Lioni)
Videoprint terminals cance
either instant print, negative a
transparency. The Videoprint

3000 works with most percei-computers with colour graphics pability. The Videopriat 500 on the adapted to work with most perceived and the colour graphics of t

sophisticated raster grophic

serial impact printer produce random, batch or sequential nas! of Code 39 labels or tags. A back two-line printer, the 8220 point bar code with an interpretate line and one line of free text. The printing mechanism consists of t continuously rotating print date and electromagnetically actual print hammers. Data input a through an RS232C serial h

Kennedy International (R. 6

The 9800 half-inch tape ties-port incorporates a dual-density operation at 556/800 cpl, tri-kei automatic chipping levels, & function, LED indicators with dual-density embedded fense iters. The series 7000 disc drie it fixed-disc drive employing Win chester technology with one, in and three platters providing loss, 12, or 20 increbytes of unit matted capacity. The model 64% cartridge lape system is a backso for discs comprising the mode 64 cartridge tape drive and the mode 650 embedded formatter.

MANNESMANN-TALLY

Manneamann Tally (B. Lavelle)
A range of peripherals best displayed include: MT1602 in matrix printer which is blief tional 160 cpl and interfaced with Controlling and Interfaced with the controlling of Centronics or Data Products; the T1612RO, receive only, 7x 7.8 9x9 serial matric printer; by T72000Q 200 lpm line printer and the T3300HR 300 lpm high reso-

MICROPOLIS.

On show will be the Micro Da 1200 series of eight inch rigid dir drives for mini and microcor applications, requiring high speed random access disc storage at a lower cost than the 14 inch drive-The series incorporates up to three platters and uses a Winchest type head/media technology. But consists of a drive mechanic personal provides interface for the provides for the provides interface for the provides for tachment to a controller. The insingle controller.

feature of the 4420 is emulation of DBC VT 52, Hazeltine 1500 who Lear Siegler ADM3. The 480 model is VT-100 compatible,

MILTOPE

QUME
Facit (J. McDonsid)
ISO Data Sales (K. Osborne)
Fedured is the Sprint 5 KSR
printer that produces letter-quality
copy at 55 chps. Many options can
be elected to configure for a particular data terminal or printer. MICRO-TERM
Facit-Addo (J. McDonald)
Three video terminals with the different emulation possibilities will be exhibited. The 4410 cml will be exhibited. The 4410 cm. lates Lear Slegler ADM 3A and Hazletine 1410 and it has ching capabilities; block transmission video attributes and prister part. RAMTER CORP The 4420 and 4430 have separate keyboards and non-glare phomic displays which tilt and swire. A

RAMTEK CORP
Terminal Diaplay Systems (R. Crumpton)
The 6000 Series colour computer is provided with English language commands auch sai circle, line, fill, etc. A range of resolutions is available to suit various applications from 512×256 to

The 6000 is an impact printer suitable for mini or microcomputer outputs, producing hard copy for CRT terminals, small business computer systems or as a message receiving printer. The 1000 magnetic tape communicating system is a triple port storage device with RS232C compatibility. Also on display is the 5100 sape cartridge atorage system for military applications.

STEP ENGINEERING ISG Data Systems (K. Osborne)

rate of 250 KC (500 KC double density). Track-to-track access is accomplished within alx millise-The Step 111 bit-slice deconds. The device is designed to M1L-B-16400 and MIL-Mvelopment instrument is a hardware development tool for all bit-slice applications. It incorpo-38510/M1L-STD-883 class B rates the world's fastest PROM simulator, a built-in logic static analyaer plus terminal and debug-Nasbua Computer Products (F. A range of disc packs and floppy discs includes the Nashua 4473

STORAGE TECHNOLOGY STO Storage Technology (C. T

disc pack - 300 megabyte - for use with CDC, Prime, Wang, and The 4500 atorage subsystem in-creases the productivity of inother equivalent disc storage drives. The 4464 80 megabyte disc pack is for use with ICL, GEC and on display is the STC 8650 double similar disc storage drives. The 4443 disc cartridge – five and 10 megabyte – can be used with DEC, RLO1, and RLO2 disc storage drives and Nashua 4420 disc density disc drive which offers double the amount of data per spindle, or a total of 1270 mega-bytes. There are two models of the STC 8650; Model A2 contains string of up to eight spindles and must be attached to an STC 8000-11 disc control unit; Model B2 at-Dependables are single and taches to the 8650-A2.

multiple output, high-current power supplies for OEM digital applications. Output transients caused by active loads do not exceed the regulation band in either overshoot. SUMMAGRAPHICS Terminal Diaplay Systems (R Bit Pad and 1D provide XY coordinate information to the com-puter system. The Bit Pad 1s for overshoot or undershoot. The main features include the widest range of brownout protection; 30 millisecond output holdup after input power loss with full load cursor control, education, design and draughting, business, medi-cal, petrochemical and games. The protects volatile memorles; abortcircuit proof and overvoltage pro-ID range caters for the user who exacting data manipulation within

PLESSEY PERIPHERAL SYKES DATATRONICS

Plessey Peripberal Systems (S. King)
The stand's centrepiece is a microcomputer system based on the LSI-11/2 processor. There are The Comm Stor range of comalso a number of add-on peripheral muncations storage units com-prises four models for straching to products from the range of equip-ment for DEC and Data General VDUs or printers to provide data storage. They provide elaborate data preparation, logging, editing and forms capability. Time Euro Einctronie Instruments (M. Dalley)
The 6000 is an impact printer sharing users are promised savings

PIONEER MAGNETICS, Sintrom-Ellinor (J. M. Ellinor)

TDX PERIPHERALS
Euro Electronic Instruments (M

in phone costs and connect time

On display is the TDX Series 11 which is a 75 lps tape transport, suitable for OEM and end user

TELEPROCESSING PRO-DUCTS Aspen Electronics (P. A. Johnson)

Johnson)
A modern simulator, the TP232, is used to replace a pair of
moderns in short distance local applications. The TP-270 Network Analyser measures system response time in a 3270 network. More significantly, it provides specific measurements of the elements contributing to response time, so that changes can be evaluated.

TEXAS INSTRUMENTS Texas Instruments (A. Sim-

applications from 512×256 to monds)

1,280×1,024 A maximum of 16 The Silent 700 and Omni 800 colours can be displayed from a terminals include both the 745 and palette of 64. Typical applications 765 portable data terminals, with a c management information the latter incorporating magnetic systems, automation control and educing high speed printers the 120 cation.

ter, with the 150chps Omni 800 impact printers, the 810RO and 820KSR, are also on display.

Euro Electronic Instruments (M.

Power peripherals being displayed include Line 2 power conditioners, an ultra-isolator and AC line regulator. The Line 2

Products from over 40 US

manufacturers on display

combines noise-suppressing capa-bilities of the ultu-isolator with the regulating properties of the AC line regulator.

Sprint 5, the microbeead deleywheel

printer from Qume Corp ie designed for eesy Integration

proceeeing epplications. The

versions.

printer comee in

keyboerd and receive-only

Versatec Electronies (W. R. Bof-

A vector processor on this stand provides offline vector plotting and translates vector plot data to

raster format while freeing the all print, vector, compressed rasnetic tupe. In addition there is the V-80 series of electrostatic

printer/plotters. The main features include: high-speed printing, 1000 words per minute; high resolution, 200 nibs per inch and multi-func-

Peter Weighill an 01-

US Embassy

February 3-6

show should be directed

Wabash Tape (UK) (J. A.

magnetic tape produced and fied in a virgin state with its tered surface guarantee minimises error growth por for read failure, eliminates no



Only one company buts this multiple in a £475 teleprinter. 30cps teleprinter its compatible with just

about every computer there is, it's dependable; it's readily available. And it costs just £475 on orders of 200. Only the LAGA relegant the costs of 200 something in an ufacturer could charge so little for it. al" ionisee: Mete rue Molicie legcii

manufacturers of terminals. And when you look at the LA34, you see why. Principal Features: Desk top unit based on conventional

typewriter design – ensures rapid operator acceptance. 2. True 30 ope averate speed, 45 operatoh-

3 9x7 dot matrix gives remarkable clarity.

4 Full 128 ASCII character set. 5 10:12 13:2 or 16:8 where there wer inch. 6: slip to 13:2 columns being standard fort. 218 columns using compressed font;

7. Adjustable line spacing: 2, 3, 4, 6, 8, or 12 lines per inch

8 Uses ordinary paper; single sheets. of continuous listing. Easy-to-change cartridge ribbon.

10. Just 25lb weight

Numeric keypad, Tractor feed, Termi switch. "Paper low" switch. 20mA interface. Extended logic option. Optional spacing.



We change the way the world thinks.

ACCESS PATH FOR A FUNCTION

NHS No

Imember) oparetion

(montbar) Activo Modicatio

Function name: Handle Patient's 0
 Receponae reg'd: Online | Immadiata
 Frequency assumption 40 max per month, 40 avar per month/security 09/

Actien Vol Not

FUNCTION ANALYSIS DOCUMENTATION

How to become a competent programmer

Guide to Good Programming
Practice, edited by Brian Meek
there is a contribution entitled Design of Algorithms, which is one of transcriptated. and Patricia Heath. 128pp.
£10.50 (hardback) and £3.95
(paperback). Published by Ellis
Horwood Ltd, Market Cross
House, Cooper Street, Chichcster, PO19 IEB.

grouped in five chapters with contributiona from 10 different authors, providing a readable occount of an excellent range of top-

Chapter 1 is entitled Strategy and Design and the introductory section states: "The object of this book is to present, in a compact and assimilable form, the essen-tials of what is involved in being a but there are points which can be scrious and competent pro-

Readable

The chapter goes a long way towards achieving this objective and the topic of good programning practice is best approached in this format.

the longest essays in the book.

It is both readable and, among

gether with some simple examples. This is a technique which is often difficult to explain to students who have not found the need for it and this account is very well pre-

Chapter 2 is on program writing and covers choosing the language, programming language standards

The programming language standards mainly refer to Portran,

applied to many languages. The essay on structured prograntoing is practical and one of its best features is analysis of a subroutine presented first in its original, unstructured, form and then re-written with the improve-

then re-written with the improve-ments explained in detail.

The third chapter, Program De-velopment, has three contribu-tions: Structured Programming In a textbook any omissions, and these would be locvitable, migbt lead to criticism by a render missing his or her particular fetish.

Taking a few essays at random may give some impression of the topics covered. In the first group

Chapter 4 bears the heading Special Problems and covers heuother things, gives a very good ac-count of recursion with reasons and justification for its use to-programs with long run times and real-time programs.

One example worthy of note is contained in the essay Large Quantities of Data which uses as an example the computation of mean and standard deviation from a act of data. This is one of the

This taxt is to be recommended most strongly to any student or practising programmer. The more experienced may not agree with every statement or view expressed in the book but would acknow-

ledge the thought provocation. As a final quote from the Intro-duction explains: "Some of the ad-vice may strike you as trite and obvioua; if so, well and good. If aome helps you to recognise, for-mulate and rationalise thinge you already know into a coherent 'phi-losophy of programming', even

"If anything strikes you as a new Idea worth considering (or possibly as a brilliant flash of enlighten-mnotl), that is best of all."

nity for English-speaking representatives from some of Japan's leading computer manufacturers eramnnt applications, computars in everyday life and information processing and aducation. K.J. AT THE CENTRE OF EUROPE'S BIGGEST & CONCENTRATED COMPUTER MARKET

IFIP report is weighty in every sense

Proceedings of IFIP Congress and research bodies to describe their work to a large Wostern 80. Edited by Simon Lavington. 1070pp. \$102.90 North-Holland Publishing Co, PO Box 211, Amsterdam, Netherlands. Tel: 010/31/20/5153347.

AS consolation for those unabla to attend the IFIP 80 congress beld in Tokyo and Melbourne lact October, the proceedings are now available in the form of a hardback book which le weighty in every eenec of the word.

Edited by Simon Lavington of Manchester University Department of Computer Science, the book details all 160 or so invited and eubmitted papers, diacussing the information or manage pre-sented often considerably more comprehensibly than the actual spoken presentation.

The only major parts of IFIP 80 not covered are the 30 plus panel agacione held in Tokyo and elbourne. Summarise of these were echedulad to appear after the congress in the Australian Computer Journal and the Jour-nal of Information Processing published by the Information rocessing Society of Japan. IFIP 80 was the first World

Computer Congress organised by the International Federation for Information Processing to be held outside North America and Europe and the first to be staged Tokyo provided the opportunity for English-speaking representatives from some of Japan's

case for **'project'** approach

Making

delegation. The Japaneae papers included fascinating occounts of Project Management: A Sympton Approach to Planning, Sci. duling and Controlling, heard Kerzner, 500pp, hellished by van Nostrand keinhold (1979). novel computer arehitectures and dedicated database machines. Database technology, with the social and economic implications hold (1979). of computers, were the two topica treated ae areaa of interest in

THIS book sets out to sell the let of project management - including around the production of 1 kg their own right for the first time Invited papers in the social and economic area included a depreasing but thought-provoking discussion initiated by Calvin Gotlieb of Toronto University cular product. Kerzner aguste a project atructure leads to gree management control, better et manigement on an eventual bener manigement control of the cont Department of Computer

performance for the company. Using plentiful examples to Science.
Gotlieb predicted that the use of computers would inevitably case studies, Kerzner shows boy become more controversial with project organisation can be just scrious ucemployment a cerduced in a company and her ahould be organised. tainty in the manufacturing sec-

Later chaptera explind; He produced figures showing innning procesa, show ba: how acveral different organias-JANTT and PERTICPM Into tions had increased productivity ques can be used in scheduling a: dramatically deapite big raduc-tions in their workforces and saw view, describe pricing, and a nin schedule and cost contol! Kerzner writes confident, i a day when computer profes-slongla would refuse to particiahort sentences rich with Ame pate in job-shedding projects.

The eight other subject areas can management jargon, but it

standing of his subject and in The book shares the four must management texts - mis; the process seem very straight ward and simple - but the me

Fun approach to maths

covered by IFIP 80 wore theoreti-

cal foundations of information

proceesing, computer architec-

ture and bardware, software,

nications, computing in science and industry, business and gov-

computer natworks and commu-

Adventures with your pocket calculator, by Lennart Rade and Burt Kaufman. 139 pp. 95p. Penguin Books Ltd, 536 Kings Road, London, SW10 0UH. Tel: 01-351 2393.

ONE gripe I have always had against pocket calculators ie that they weaken drastically the user's powers of mental arithmetic, Here is the antidote from Penguin

Both mathematicians, the authors assume that the reader knows his/her way round the keyboard. If you don't, first read up

on how to use a calculstor.

The book is divided into two parts: a section in which the adventures are outlined and a section in which comments are made

Most makes of calculator will be adequate for the exercises, though . unless you want to work ou we

There are 20 chapters com magic squares, playing rein numbers, least common munical squares, palindromes, the posets number, prime numbers, etc.

As a fun approach to mathing using pocket calculators, & a doubtedly succeeds: it may real

Feast of DP meanings

The Essential Computer Dictionary and Speller, by Charles I with more than 100 pictures.

Sippl with JoAnne Coffman Much of the information will be familiar; some of it less so. For

DP PROPLE and those who very street white about them are constantly extending their vocabularies with the latest buzz-words, acronyms,

and technical jargon.

For anypne whose job retuines is a miliarity with "computeress" or "electrospeak" (these words, incl-dentally, are not part of the dictio-nary; but chiled from the fly-leaf) this volume provides a ready source of both spellings and meanings. it defines more than 15,000

familiar; some of it less so. For instance, hands up all who know what is a variolosser* or a Pros-And If you thought that

"smudge" was an acronym for the latest in new technology, test asnothing more than "in optical character recognition ink that is some place it doesn't belong!" Did we really need to be told that?

Rromench explanations, readers designed to be seen to b will have gleaned that the authors are American. Hence some slightly unfamiliar apellings ("defense",

"fiberoptics", "signaling")
Sippl is a computer today
consultant, and was the suche of
"Computers" for the Encyclose
dia Britannics, while Johes
Coffman Mayer is Director of the
Processing at Paloinar College, w
Marcos, California,
Whatever unfamiliar works
spellings they have come up on
this volume could well prove the

an essential reference fook clse would the review copy and found lie way to Computer Webs sub-editors' desk? sun-editors' desk?

*Of critise you all knew this ration act is "a variable attenuator of a design whose loss is controlled by rolls of cutrent"; and Prospere state blanks process control system.

Mine of standards information

Programming Language Standards of Programming Language Standards are designed programming Language Standards are designed processed of standards are designed processed for software system. While such the context of a particular language of standards are designed processed for software system. While such the context of a particular language of standards are of the whole subject. Part I consists of swide residence of software system. While such the whole subject, Part I discusses particular software standards are obviously valuable, and comprehensive introductions are the whole subject. Part I discusses particular software standards information software dearly a particular software standards information software standards information software dearly designed process in formation software standards information software standards infor

DATA ANALYSIS

PART 14 of the series described

the technique of access path analysis, a method of determining and documenting the types of enti-ties and relationships involved in a

In order to perform access path

analysis we had first to identify the

"elementary functions" and then to draw functional models describ-

Documentation

To help the database designer,

not only must the access paths and entry points be determined for each function, but quantifiable

facts must be available on the fre-

quency of the activity on the data.

knowing that the patient entit

type is accessed, unless it is also

known how ofteo it is accessed

500 times per day, 200 times per month, etc. When designing a database only a certain number of

access paths can be made efficient,

hence the most important func-tions must be established and fre-

quency estimates made. All the

asic facts are available to provide

The "Access Path for a Func-

tioo'' documentation forto le

the example used in previous arti-cles, the "Handle Patient's Death"

In Part 10 the fuoction "Handle Patient's Death" was described and the form used to document

inctions was shown. It can be

seen that the frequency of the func-tion was documented. It is this

figure that is used to make the

requency Assumption (7) go the

that required by the user, e.g. he

may be prepared to let it wait for a

day, it may be urgent (because it affects other fuoctions), or it may be so infrequent and unimportant that the response required may be "within a week":

Access path for

function form

The description from the func-

tion form, the data flow diagrams and the fuoction hierarchy are allused to perform access path analysis. The steps used to draw

the function models were ex-plained in Part 14. The access path for a function form is filled out at the time the function models are

drawn. It is achieved as follows:

1. The description of the fuoction

worked through and each entity

type and relationship type listed in

2. The setion on each entity type is

are used to denote the permissible

M - Modify (one or more attrib-

utes of the Entity)
Retrieve

Operation is

sometimes (%)

o be involved.

actions:

B. An entity

Figure 3

order in which they are likely

The Response Required (6) la

this information - it only requires

that the data be summarised.

More complex functional models

Section I — Part 15

of our series describing a system design methodology

by Rosemary Rock-Evans

ing them. Access path analysis has several purposes, two of which appointment have been deleted. 3. The action on each relations and the provision of the facts for database design - will be explored type is recorded. The following symbols are used to denote the permissible actions:

- Connect (add a member - Disconnect (delete a member

Transfer (disconnect e member from one relationship it to another of the same

Patient

ENTITY TYPE/

RELATIONSHIP TYPE

Patient
Patient contracts llinass
Typs of Illness

R - Retrieve (Implies use of

4. The selection criteria used

access an entity type are recorded. Selection may be made via:

a) The attribute types which constitute the key of the entity type, e.g. in the example, the NHS number is the key of the Patient.

b) The key and other attribute types, e.g. if a range of keys was known but further selection was to

The term intersection is also

Figure 2, "Intersection,"

relationship type only)

entity type.

ties of different types. An example is shown in Figure 2 where an "Illintersection between the relationships with two entities Patient and Type of Illness. 5. The Volume figure always des-

cribes the number of cutities of the entity type which are accessed ber function, Nt) I per month, or per day, etc. The per mouth or per day nica are calculated later.

SELECTION

Type of Illness code

tity types accessed, are available:

a) The figure can be completed by

form the maximum, average and minimum degree of the

relationship were documented as shown in Figure 3 (the example is of the relationship type "Patient"

or the relationship type "Patient Undergoes Operation").

set at two.

The same process can be per-formed for an Appointment. As-anne the average degree is 1:6 and

related to (an byerage of 4 entities of type Operation

ACTION

Thus, in our example the func-tion "Handle Patient's Death" handles one patient at a time. To calculate the volume of other en-

completed, the task of Cancelling the Appointments would on aver age involve 3 Appointments. ximum figures can be used as well, if desired.

The Access Path Forms will be discussed in detail in later parts of the series, when database design considerations are covered. It can seen, however, that knowing respunse required, and details of the frequency of functions, provides the database designer with very useful information

Temporary entities

Access path anelysis occasionally leads to the discovery of enuity types which have not been identified in the earlier etages. It is possible for entity types to be created and destroyed during the execution of an elementary function, making the entity type so temporary that it may not have been identified until the function has been examined in depth. Temporary entities can be as im-

riant as the more perroanent enuties which are used by more than one elementary function, and must be documented and shown in the

It is often found that these temporary entitien have attribute types, which under the old systems Owner

design methods might have been found in the working storage section of a program, or io "transac-tion files". These entity types are not transaction files, however, nor entity sub-types. They have their own unique attribute types and definition: for example, in a payroll system the Salary/Wage Payroent entity type, i.e. what the employee received as pay in the week, may only exist for the event "Pay Employee" and then be arch-

Entity type (E) relationable type (R) - Accessed

Petient undargoas

Patient hee Pationt's Madication

ationt's Modication

Decisions to be left

Decisione on which attribute types and entity types are to be porary should be left until all the was developed at CACI by functions have been analysed. The

importance which requires the part of the DBMS and of permanent nature Decisions such as these never he made at the ar stage. Compromises should ever be made during design, all the facts are known, an

"temporary" entity types ar didate transaction files, but

be found that they have add

during analysis, when they a This article has covered the functional model. In the part of the series the Access Analysis Forms will be us summarise the functions'

The Data Analysis method

TDS offer the ADDS Regent 20 for a slittle as...

The Relationship Type Form was discussed in Part 5. In this c) Attribute types other than the key, e.g. All Males (sex code) over know that for every Patient, who so (date of birth). Where entities of one type are accessed via a one to many relationship type with an entity of another type, 11 is said-flust the single entity is the gund and the single entity is the gund and the relationship are the manbers. The term intersection is also be tat two.

it's the Best for the leas easy to read 5 x 8 characters in a 24 x 80 character format: EIA Interfaca: speeds up to 9600 baud. Ful Incramental cursor movement and addressability - anxillary output interface, print transparent

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In our example the attributes of one type are retrieved by using the the entity type Patient have been relationships with two other enti-Pottent ia sometimes (80%)

PRODUCT NEWS INTERNATIONAL

Cassette drives add **ZIP** to Data **Dynamics range**

A TERMINAL, the ZIP
ASR/K7, incorporating two mini
cassette drives, printer and keyboard in a single unit is available
tion header of up to 20 characters.
Data is stored in blocks of 249
characters and each cassette hos a
31,872 character (128 block) capafrom Dats Dynamics.

This unit is the latest addition to Data Dynamics' range of ZIP computer terminals and can be used on a desk top or optional purpose-

Cassettes can be operated in either a local or online mode, fully emulating the paper tape reader-punch facilities available on a paper tape ASR.

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As with the paper tape ASR, the cassette version responds to DCI, DC2, DC3 and DC4 control codes and operates transpareotly to the

31,872 character (128 block) capa-

Although up to 10 different files can be opened on each cassette, any file can be as long as required. Communication online with the ZIP ASR/K7 is at 300 or 110 baud.

The standard interface is V24 (RS232C) or 20mA current loop operating at half or full duplex (uscr selectable). Even, odd or oo parity may be chosen. A seven-needle print head is employed which prints the full ASCII

character set in 5 x 7 dot matrix The ZIP ASR/K7 with a friction drive can employ standard

nd operates transparently to the lost system.

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Data Dynamics (CW), Data-lost system.

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THIS easy-to-progrem IC test eystam, devaloped by Mineto, le avelleble from MIT (Engineering) et e coet of eround £17,000. The aystem enebles ell TTL davices to be tasted end carries out DC perametric end functionel testing of perta up to 24 pins.

Called the Mineto ICT 4100, it has a VDU, six ewitches and a thumbwheel. Progrema are stored on floppy diece,/paper tepes or cassettee end feuit enalysis can be carried out.

Test resulta ere given by GO/NOGO ae well es diaplaying three sligits on the DC teet. Floppy dise, and paper tape readers/punchee are evelleble as

options and MIT le currently devaloping progreme for all teetable davicas, the results to be sold with the system on offer.

MIT (Engineering) (CW), Greenhill Industrial Estate, Riddings, Derby DE55 4DA. Tal: Leabrooks (077-384) 604411.

Open reel tape drive with advanced features

TEKDATA Electronics has re- The drive can be returned to a leased an advanced open reel tape drive. Full advantage has been formatter after power failure and drive. Full advantage has been taken of LSI low power Schottky TTL with a recording density of 800 or 1600 bpi (NRZI/PB).

is determined by the tape automat-

there is no need to reload the tape

The system can be switched by the tape drive, formatter or uoder program control and operator error is eliminated when reading back tapes as the recording density is determined by the tape attack. Maintenance has been simplivoltage can be eccommodated with sn average estimated power con-sumption of 140W (250 Watt

four drives dais y chained. There are 8-inch (MT-800) and 10-Incb (MT-1000) reels. All models accommodate ISO, ANSI, ACMA, JIS and IBM-compatible control system is available on re-

The formatter has been simplified compared to conventional designs. It is small enough to fit inside the tape drive unit with up to four drives daisy chained.

data formats enabling tapes produced on the MT-800/MT-1000 to be processed on computer systems

control system is available oo request from the company.

Petbow (CW), Sandwich,

Kent. Tel: 03046 3311.

Brochure

Paper Tiger to bridge print gap

peripheral specialists, has introduced a printer which is said to bridge the gap between conventional matrix and daisy wheel

The Paper Tiger 560 offers full width 132-column printing at 160 chps, and many "print versatility"

Unlike most daisy wheel prin-tera, it has an inbuilt tractor feed

To achieve this level of printout, Teleprinter Equipment has developed a unique nine wire staggered column balliatic head overlapping the dots of each mat-rix character vertically and horizontally with one pass of the print head filling in the gaps between the dots.

Despite being more sophis-ticated than other print heads, the new uoit has a proven life of at least 300 million characters, a figure which many of its conventional counterparts cannot match.

To cut consumable costs, the ink ribbon drive mechanism is designed to use all parts of the rib-bon. The cartridge contains 36 yards of ribbon and is rated to print up to 16 million characters.

Another major feature of the unit is that it incorporates a bidirectional logic-sceking device allowing reverse printing and white apace skipping.

The 560 also has selectable features like mono or proportional spacing, eutomatic justification, programmable horizontal and ver-tical tabbing and "fine" positioning for word processing appli-

selectable character sizes, panile and RS 232 serial interfaces and XON/XOFF line protocol. Teleprinter Equipment Lid (CW), Akeman Street, This Herts HP23 6AI.

Printer takes a bow

ROXBURGH Printers has added the X80SP Intelligent Printer Plotter, to its existing printer family, claiming that it included more features than ady needs printer in the same wise seeds printer in the same price range.
These features include these

charecter generators each will 128 characters (one being fully progremmable), bl-directions printing and paper feed, 8 rt matrix, borizontal and verice

Verious versions are svallable with interfaces for: Pet, Apple II. HP, Centronics parsiel se

The X80SP la 49.5cm with 31cm deep and 14.5cm high will weight of 9.5kg, the RS232C/20mA version retain at £840 and £795 for all other mar

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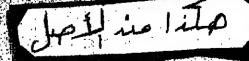
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Computer Sales People...

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We're looking for top sales executives who can five with the pace and help maintain our No. 1.

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Ideally with experience in selling computers although a proven track record in selling interactive.

business equipment would be acceptable basic salary plus generous commission be £20K on larget. Many of our sales executive lot more. Big company benefits apply main good company car

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> **Recruitment M**anager, Systime Limited, Concourse Compuler Centre. 432 Dewsbury Road Leeds LS1

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Making Computers make sense.

International Personnel Consultants
Modus Management Services Limited
148 Watling Street, Radlett, Herts, WD7 7JH

Telephone: Radlett (09276) 3077

New Technology is just History in this Company

Our client is one of the lergest independent softwere and systems services compenies in the world - a company which has a long history of involvement in some of the most innovative end important systems ever developed. Indeed, some of the British company's echievements are well known both inside and outside of the computer industry, providing benchmarks for successive development projects underteken by other organisations.

Guaranteed Growth

The increese in business now concluded for 1981 end beyond, is in stark contrest to the leck of growth currently being experienced by some crees of the computer services industry. The immediate result is that the number of professional staff will be substantially increased, since the new business will provide on-going project work tor successful candidates.

Career Prospects

In view of the growth factor end the way in which our clients assign steff to project work, there is no doubt that there will be progressively more room for extremely senior consultency and project management positions as time pesses. Additionally, our clients approach to project control and system design is entirely modern end exposure to these methodologies is certain to enhance and increase individual professional capabilities.

£10,500-£13,500 range, elthough a few more senior positions are available. Naturally, additional benatite such as a penalon scheme, free BUPA, interest tree season ticket loans at cleo apply.

The Company H.Q. is in the West End of London, so eithough most eppointses may be working on site in the N.W. Home Counties for most of the time all candidates must be prepared to work in London. Full relocation expenses will be sveileble it necessary.

Systems Analysts

These positions equate more readily to "Sanior Analysts" positions in general and would therefore be suitable alther for individuals already at Sanlor Analyst level looking for a mova to consultancy work or for Individuals who feel thay are ready for promotion.

- Essantial expertise must be thorough experience of establishing and .. dafining user raquiraments.
- · First-class communicative akilia, both oral and written, will naturally ba axpected from all candidates
- Knowledga of modern analytical mathoda, such as data analysis, would be a major asset sithough not a pra-raquialta.
- Machina and softwara backgrounda are not relevant at this stage but exparience of on-line-systams is absolutely assent prafarably for large multi-user and multi-site systems.

Systems Designers

A broad range of ekill requirements exists within verious design teams, providing opportunities both for dasigners with a leaning towards softwere and for Analyst/Progremmars who heve not movad into pure

'The technical areas of particular interest are:-

- Communications Systems Dasign Including massage switching, voice network, traffic pattern end work load pettern establishment
- Software Design and Programming development work on both operating systams and communications interfaces.
- On-line Systems Dasign experience of man/methine interfacing and tarminal based systems is essential.
- Database and DBMS Daalgn knowledge of how a vast emount of Information can be etructured, processed and distributed.

Contact: Andy Wright or Mike Creamer

Cornwall Education Committee CORNWALL TECHNICAL COLLEGE, REDRUTH PRINCIPAL: Dr. K. Farnell CORNWALL MICRO-ELECTRONICS CENTRE Applications are invited from sulta

Senior Lecturer in **Micro-Electronics**

This is a senior poet covering all sepects of microelectronics on a broad front, ranging from the angineering sapages, of system design to software deyelopment in the tields of Deta Processing and Control.
Engineering:
The successful applicant will be expected to be
well qualified, particularly in electronic engineering,
and have had significant hende on experience of
modern micro-processor besed systems.

SALARY: SENIOR LECTURER:

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Further details and application forms may be obtained from the Principal to whom completed forms should be returned within three weeks of the appearance of this advertisement. Signs, please.

ECornwall

ANALYST/PROG. Attractive opportunity for self-starter with sound commercial systems exp. and fluent COROL or BASIC. For small expanding OEM, Central London,

Systems exp. and fluant CUBUL or BASIC. FUI spiral experiency.

PROGRAMMERS: Financial information service + 2 years; exp. BAL or PL/1, City.

PROGRAMMERS: Financial information service + 2 years; exp. BAL or PL/1, City.

Ref. 81/26

SYSTEMS ANALYSTS: For Banking Systems development, 2-4 years; exp. BASIC essential. DEC and Banking exp. desirable, £7,000-£8,500. Cantral Long don.

PROJECT LEADER, For customer lectinical support, 4-5 years; BASIC essential.

DEC and Banking exp. desirable, £8,000-£9,500. Central London

Ref. 81/23

ASST, D.P.M. Exp. Analyst/Prog. with Banking exp. £10,000-£10,800. City.

Ref. 81/23 OPS SUPVR Exp. Senior Op with supervisory exp. 9/34 or DEC. City. Ret. 81/24

SYSTEMS PROG. IBM Airline Control Program, exp. 3-6 months, Lo



70 Borough High Street, London SE1 1XF

5th FEBRUARY COMPUTER ENGINEERS TEST & REPAIR Interviews at Cunard International Hotel Shortlands, Hammersmith, W6 01-572 0933 PRIME

SYS. DESIGNERS

COMMERCIAL

Senior Systems Designers with 5 or more years' experience in the design and implementation of lorge on-line commercial systems (IBM) plus specialist knowledge of tMS needed by British Software House: London base but initial term overseas (c. one year). Excellent overseas ellowances.

£9-11K

HOLLAND

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Analyst/Programmers, 2+ years' in com-mercial environment and COBOL pro-gramming on IBM 370/4300 or HP equip-ment, required for Commercial Systems Group of Major Oli Company, at their Weat End offices. TP and Datobase experience also of considerable interest. Excellent company benefits.

£8-11.5K

SPECIALIST

Data Anelyets - IMS

specialists who have ex-perience in systems design and implementation re-

quired to fill technicol

specialist role and eppiles

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Programmers end Analysts with 3+ years' mini or micro Assembler (DEC in particular) experience plus relevant (i.e. scian-ilic) degree required for producer of Industrial Control and Automation Systems. Offices in Herte. £7-10K

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Hardware and Software specielist with good micro knowledge required by Micro Manufacturer to provide softwere implementation and sup-port service from London basa. Wide-ranging appli-cotions. c ÉlOK

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Analysis, Designers and Programmers with reel-time control experience on minia or micros (Assembler level), wanted to join European brenches of Systems House specialising in the automation field. Generous relocation, some positions

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Programmers, Analysis and Team Leaders with COBOL experience and, ideally, some knowledge of structured programming lechniquee required to meet expansion plens for development centre of leading menufacturer. Dagree preferred. Commarciol/financiel epplications experience necessary

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10 Grenville Place London SW7 4RW 01-373 3063

Computer Service Engineer SAUDI ARABIA

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SHAPE Technical Centre - a NATO Research Organisation - has a vacancy for a

SENIOR SYSTEM **PROGRAMMER**

INITIAL SALARY DG.37,125 NET PER ANNUM

for its Control Data Cyber 740 computer system. The successful candidate should have broad experience in data processing with at least three years in systems programming for a CDC Cyber/6000 computer system.

Good knowledge of programming in high-level languages and macro-assembler at the operating system level is required.

Starting salaries will depend on qualifications and experience and may be increased dependent on the family situation.

Applicants (NATO nationals only) should send a brief personal résumé to Personnel Officer, SHAPE Technical Centre, P.O. Box 174, 2501 CD The Hague, The Netherlands.

IBM MVS SYSTEMS **PROGRAMMERS**

DOS/VS/E c. £13K SYSTEMS **PROGRAMMERS**

Continued software expansion is the key reason why many of our dients require the above professionels.

We et independent Software Support require in-house Systems Programmers for our expending support Group. You will heve about 3 years' DOS/VS, DOS/VSE expendance end be looking for a more rewerding end challenging future.

The benefits are excellent and include some internetions

Assembler Programmers with 1-2 years' experience, c

Chief Technical Programmer, 212-213k. Must be eble to lead up and motivate smell team. Senior Programmer, PL 1 Assembler, 2714k neg Programmer, PL1, £54k neg.

Senior Programmer, IBM, Cobol, CICS, good prospects for advancement within company, £84/k.



PROGRAMMERS

Must have COBOL DL/1 experience. CICS an exect.
To start Feb. / March 1981

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POLYTECHNIC OF THE SOUTH BANK Dapartment of Mathamatical Sciences and Compute

> PRINCIPAL LECTURER IN COMPUTING

LECTURER II/SENIOR LECTURER IN COMPUTING

AND TEMPORARY LECTURER I IN COMPUTING

A Principal Lecturer te required for April, 1981, and Lacturar II/Senior Lecturer for September, 1981, to Me Computing in the Department of Melhematical Science and Computing. This is a lively department able to describe the computing of the second computing of the second computing it provides a range of professional Computer Studies courses of the second computer second computer

The Principal Lecturar is required in order to a course development and ancourage research and tancy work. A higher degree in Computing is together with research end teaching ability and sometimative experience in education and/or industrial available to apaciellate in either Computer Data Processing.

The Lecturer il/Senior Lecturer is required to teach in assist in the administration of the department's

Candidales should possess a degree in Computing subject specialism which includes Programming ing experience is desirable but not essential.

The Tamborary Lecturer II is required as soon as posted the appointment terminating on August 3, 1881. Its position would involve teaching Computing and posses a small commitment to the Microcomputer Adverse Centre. Candidates should possess a degree in Computing and a subject specialism which includes Promit ming, Teaching experience is desirable but not essential.

£10,509-£13,245 £8,962-£10,539 £6,012-£9,702

Salary scales

Principal Lecturer
Senior Lecturer
Lecturer | £6,012-1Plus E769 (London Allowance)

and further particulary
and further particulary Application form and further particulars available to Starling Office, Polytechnic of the South Bank, Sorol Road, London, SET DAA (Tel. 5) 422 596. Ext. Sezi. Closing data for the receipt of completed application Fabruery 23, 1981

COMPUTER WEEKLY, January 29, 1981

Super Opportunity for Supervisor, Shift Leader and Operator

to strengthen the existing operations team of a major West London Installation

A two megabyte IBM 3031, running under DOS/VS and POWER/VS is utilised, but software will be upgraded to DOS/VSE and VM in the near future. Database facilities are provided by DL/1 and the teleprocessing system runs under CICS.

Salaries offered are competitive, conditions of employment are excellent and the benefits package is most attractive.

Operations Supervisor to £9,500

Responsible to the operations manager for the control of operations, support and job control departments. consisting of approximately 20 staff. An in-depth knowledge of DOS/VS and CICS is required plus previous operations supervisory experience. Training in VSE and VM will be provided.

This is a key role requiring a high degree of management skills complemented by a strong technical background.

Above average holidays

• On-going technical training

• Excellent pension scheme

• Relocation package

Shift Leader c.£7.500

An experienced DOS/VS shift leader is required, preferably to lead a team of 4 operators working in a two shift rota between 7.30am and 10.45pm. A minimum of 2 years DOS/VS experience is required. preferably gained in an one-line environment. Training in DOS/VSE and VM will be provided as necessary.

Operator c.£6,000

Minimum of 1 year's DOS/VS or VSE experience. Additional training provided.

For further information please write to, or telephone Pat Barnes (24:hour snswer service) quoting ref CW 102-1P



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The Company is a leader in the fields of OCR, MICR and Interactive Graphic Display systems. The following appointments carry very high salaries and other benefits including B.U.P.A. membership.

operate from a new office in the West London area.

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Entry systems in Banking Finance and Commerce.

CAD/CAM Graphic Display Systems, Location: W. London or Portsmouth

Written application should be made to the principal European office at LUNDY HOUSE, 18 ORDNANCE ROW, PORTSMOUTH, HANTS. PO1 3DN

A Subsidiary of LUNDY ELECTRONICS & SYSTEMS, INC. (AMEX LDY)

We've changed offices—can we change yours? SYSTEMS AND PROGRAMMING

CITY

c. £11,000

Ona of the most successful Merchant Banks in the City is looking for a SYSTEMS ANALYST to join a standily axpanding depertment. Davelopment of ayatams for naw erass of banking operations has craoted the need for a parson with at least 2 years' experience in Analysis who is a good communicator and has a background which Includes, ideally, some ORGANISATION AND METHODS. The usual BANKING FRINGE BENEFITS will apply.

RPGII PROGRAMMER/ANALYST C. £9,000 A well-known multi-netionel in the electronics field is looking for a person with around 1B months-2

years' RPGII experience. The experience will have been geined in en IBM environment as our clients years in run expendice. The expendice will have been genied in en row environment as our chems are major users and include SYSTEM 3, 34, 370 range end elso 4300 equipment. An ESSENTIAL qualification for the successful applicant will be substantial INVENTORY CONTROL experiance.

Great package and EUROPEAN travel opportuninty.

Rai: R3175

MIODLESEX SENIOR ANALYST/PROGRAMMER C. £10,000 A major nema in the Oistributive Trades is emberking on a major overhaul end redefinition of its A major nems in the Distrinutive trades is emberking on a major overnaul end redefinition of its systems. To esslet with this development they need a person with PROJECT LEADING potential. The levoured careor profile will include a MINIMUM of 2 years' COBOL programming followed by

ANALYSIS or TEAM LEADING in a DOS/VSE environment. An excellent opportunity. Ref: R3183 **WEST ENO** PROGRAMMER/ANALYSTS

A dialinguishad OIL COMPANY with offices in the West End naed a number of Programmer/ Analysts to esslat with naw development. Salf-motiveted cendidates with a good NUMERALE DEGREE end FORTRAN programming experience are invited to apply. A knowledge of OPERATIONS RESEARCH techniques gained in an IBM environment would be perticularly adventageous.

Rel: R31BB Analysts to esslat with naw development. Salf-motiveted cendidates with a good NUMERATE

ICL 1900/2900 OPERATOR A well-known company in West London have e requirement for en Operator for their site which comprises both ICL 1900 and 2900 hardware. The necessary prerequisites are a very good knowledge of both Gils end VME/B. The company provides excellent opportunities for cereer edvancement and further training together with vary good staff banelits.

Raf: 3190

Torge ere always pleased to hear from experienced Systems, Programming or Operations staff. If your career needs a boost, contact the office for an informal discussion with one of

GREATER LONDON

CHIEF PROGRAMMER

A leading company in the laisura industry saaka a Chial Programmer to lead en axisting team ideal condidates will be familier with structurad programming tochniques and heve the management skills to recruit, train and develop stall, together with the ability to easist at the systems design stage. A COBOL background is assential and exposure to recent IBM hardware together with CICS a definite sdvantaga. Banalits include ralocation, bonus and flexitime. Rsl: 83184 SUSSEX

ANALYST/PROGRAMMERS

There ere two opportunities for RPGII ANALYST PROGRAMMERS in Suasax. We ere looking for people with 1B months-2 years' experience gained in a Systams 34 or 38 environment. Exposurs to manufacturing eystems such as MATERIAL REQUIREMENTS PLANNING togather with normal commercial systams would be helpful. Good conditions of employment epply and RELOCATION Raf: R3150/201

CITY SENIOR PROGRAMMER

Our client is an extremely well-established FINANCIAL institution offering a fine opportunity to skilled applicants. A new instellation is going to meen plenty of "ground-floor" OEVELOPMENT work. Ideally, you should have BASIC + or BASIC + 2 experience of finencial applications, probably in a OEC, SYSTIME or CMC instellation. Superb conditions of employment and benefits are ollared.

COBOL PROGRAMMERS

A leading City-based International Company seaks COBOL programmers with upwards of two years expariance. Very bright young paople with UNIVAC or IBM exparience, together with an exposure to on-line programme development, OATABASE end sales order processing would be particularly on-line programme development, UATADADE end eales often processing trouble participation welcome to epply. This is e devalopment opportunity in an expanding company olfsring excellent frais Rai: R3182

S. LONDON ICL SYSTEM 4 OPERATOR

Based in S. LONDON our cliant is looking for an experienced SYSTEM 4 operator. If you have bassed in S. LONDON our chant is looking for an experienced STSTEM & Operation. If you have between 1-4 years' experience on SYS 4 and would like to progress our client would like to hear from you. There are possibilities in the future of moving on to their larger 2900 systems. The company elso offer a lirst-class benefits package.

Rel: 2258

IBM OS/OOS OPERATORS

Vacancies axist for various lavels of computer operators who have worked on IBM 360/370 range computers. A knowledge of either OS or DOS Operating Systems is preferred, however training will to £6,500 ba givan in all espects of operations and technical areas. Excellent cereer prospects for people

TARGA COMPUTER SERVICES 6 Liverpool Street, London, EC2M 7NH - 01-283 9941

TEXACO

MVS Systems Programmer

Texaco Limited plans to convert its 2 x 4341 systems from DOS/VSE to MVS. The feasibility study will start very soon and implementation should commence mid-1981. The complete process is expected to take two years: one to plan and create the operating system, and one to convert the

We therefore need one experienced MVS person to join our team of five, who with the support of consultants staff will be responsible first for planning and setting up the new system, and then for Keeping it working smoothly and at an advanced technical level,

The Job will be important, interesting and challenging Salary, depending on experience, will be in the range £8000, ro.£ [2000, plus the usual Texaco fringe benefits

// you are interested, please contact:
Mr. R. Stonehouse, Manager, Technical Support, Texaco Limited Knightsbridge Green, London SWIX 70] Telephone: 01-584 5000

UNIVERSITY OF SOUTHAMPTON

NUMERICAL **ANALYST**

Applications are invited for the poet of Numerical Anelysi within the University's Computing Service. The successful applicant will give a supporting savisory service to computer users in numerical methods as applied to the fields of anglinearing and applied to the fields of anglinearing and applied science, and in the techniques of methometical model building.

themeileal modal building.
Tha University hee eccess to very powerful computing feelfilies end a wids ranga of diliferent machina srohitactures. The applicant will be expected to give advice on the suitability of different numerical methods for the vertices methods for the vertices of the sapecially concerned with the exploitation of naw mechins orchitactures such as vactor end arroy, processors.

processors.
Applicants should normally possess a post-greducte qualfulfoction in numerical methods of a first degree with a lerge content of numerical ensivals. Expensions of the application of numerical techniques to practical problems le highly desirable.

Salary will be within Range 18/1A: £4,796-£9,585 p.s. outsilications and experiorice
Applications (2 boples) giving
date of birth, curriculum vites
and the names and addresses,
of two referes should be sonit
to Mrt. P. Vaughen-Smith,
Staffing Department, The Univariety, South impton SOS
SNIL from whom further detraile, sain be obtained. Please
'quote Ref. 1170/ACW.
(4254)

BOX Nos.

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CHILTERNS

WORK ON NEW SYSTEMS IN A PLEASANT AREA, USING THE LATEST HARDWARE AND SOFTWARE

Our clients ere expanding their DP services to cope with the development of mejor new systems end the inetellation of e modern meinframe. Detabese, on-line and financiel modelling techniques are used, and remote minis with communications links are planned. We heve been retained to recruit for the following posts:

PROJECT LEADER \$9,000-£10,500
Sound commercial analysis experience (probably over five years) and good leadership qualities are required, ideally with knowledge of database and communications.

(Ref. 328CW)

SYSTEMS ANALYST £7,500-£8,500

This will interest analysis with upwards of two years' solid experience of commercial and accounting systems, ideally including some financial modelling.

PROGRAMMER

£6,500-£7,500 The requirement is for at least two years' COBOL, on any hardward ideally including mainframe on-line applications. (Ref. 330CW)

Working conditions are first-class (purpose-built computer centre), and career prospects in a successful, thriving organisation are good. There are valuable fringe benefits, and in certain circumstances generous relocation expenses will be offered.

Please ring us in confidence for an initial talk, quoting the appropriate reference, or leave a message on our answering machine after hours and well.

52-53 Margaret St. London W1N 7FF 5796

PROGRAMMER? BECOME A TECHNICAL CONSULTANT LOOK WHAT IT TAKES!

THE PERSON 2-3 years' experience of commercial application programming in DEC BASIC

under RSTS/E and the ability to make with chems.

THE JOB Converting functional systems design to computer systems design, implementing tailor made customer systems, and adapting standard packages to users requirements.

THE REWARD A top salary, a swift and cleor promotion path within a respected and established multi-million turnover group based in London but with provincial offices. Big company perky and travel and accommodation allowances when working away, plus many other henefits

COBOL PROGRAMMERS? PROGRESS NOW TO SENIOR PROGRAMMER

THE PERSON 3-5 years' experience of on-line IBM COBOL using VSAM and CICS, the shility THE PERSON 3-3 years experience of on-line IBM COBOL using VSAM and CICS, the shifty to control a team of 3-4 programmers.

THE JOB Developing a new on-line foreign exchange system for a major bank in the City. An understanding of FSD and the ability to produce first class program spees is essential.

THE REWARDS £10-11k per onnum plus non-contributory pension, life assurance, BUPA. Beneficial mortgage scheme, LVs, bonus and recreational, holiday and sporting facilities.

YOU KNOW WHAT YOU ARE

WE KNOW WHAT YOU CAN BECOME

If you feel you would be a suitable candidate for any of these opportunities, don't hesitate, contact Janine Jackson now on 01-734 9723 (Reverse charges if outside 01) and quate reference JH 10/120.

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Charles Barker Confidential Reply Service

Senior Systems Analyst/Programmer

London North East/Borders of Essex Salary from around £8,000

Our Client is seeking a Senior Systems Analyst/Programmar, who will report to the Data Processing Manager.

Outles will involve the provision of lechnical knowledge for all in-house computer ayelame, analysis and programming of minor systems changes, and assisting with the extension or replacement of ourrent systems as

Applicatione are invited from those experienced in Cobol RPG programming and who are conversant with IBM Model 34. Candidates must have had some formal training, at least one years systems analysis experience and a minimum of three years programming experience. Some experience of application within the insurance broking environment would be an

Senior ATE Programmer SALARY c.£10,000

IAL is a major name in the data communications field, developing advanced nucroprocessor systems to the highest standards. The Quality Control department now needs to appoint a Senior ATE Programmer.

You will be required to liaise at all levels, both within the company and with clients. For this, you must have a thorough knowledge of digital and analogue systems, experience with ATR and understanding telecommunication principles. A minimum of 4 years experience in electronics, backed with an HNC, or equivalent, is essential. If you have a background in the RF/LF electronics field, it would be a distinct advantage.

IAL benefits include 4 weeks holiday plus bonus, staff restaurant, social club, pension scheme and life assurance. Salary is dependent upon qualifications and experience and relocation expenses will be paid where necessary.

Please apply quoting ref. number K/014 to Sue Dillon, IAL, Aeradio House, Hayes Road, Southall, Middx, Tel. 01-534 5134.



THE HIGH TECHNOLOGY TASK FORCE

COMMUNICATIONS SYSTEMS COMPUTER SYSTEMS AND SERVICES WORLDWIDE **JBA**

Systems Designers

London based up to £15,000 Experienced Systems Designers are required immediately by our client, a leading computer consultancy, to take a key vote in the design of a large real-time communications

Applicants should have at least six years to the design of matoframe applications and be capable of selecting hardware/software/packages for tochistion to a system. Direct loval venient with database IDBMSL graphics or communications would be an asset. Expellent salaries according to experience.

Designers and Consultants

Surrey

c. £13k+Benefits

A newly founded systems company, specialising to information security products and services, require top level professionals already involved at the forefront of advanced computer and communications technology.

As a senior member of a project fram, you will be developing: MICRO BASED SYSTEMS, TRANSACTION PROCESSING SYSTEMS, SECURE DATA BASE AND NETWORK SYSTEMS and be working on PATTERN RECOGNITION and IMAGE PROCESSING. Knowledge of RSXIIM, Assembler, PASCAL and the Z80 interprate some of the quidifies staight. An attractive benefits parkage supports the excellent salary. **Contact: Brian Poetice**

Senior Analyst/Programmer £9,500~£12,000

The Munagement Services Department of this international bank wish to appoint an experienced Analyst/Programmer to help develop and implement new banking systems for use throughout the world. Candidates must be well enhanted, have a somul programming background and proven analytical skills, prefembly gained in a financial environment. Knowledge of IBM System 34 and RPGII would be a distinct advantage.

A good salury is compled with all the usual banking bruchts.

Contact: Is obel Bruce

Analyst/Programmers

London

City

up to £11,000

We have been retained by an international energy company to recruit experienced Analyst/Programmers to Join their Commerical Systems Group specialising in the development of business related computer systems on the IBM 4341 and HP3000 minicomputers. Ideally applicants should be graduates although 'A' level education qualifications will be

accepted. Successful candidates should have a minimum of two years' experience in commercial applications together with at least one years expendence programming in COBOL gained on either the IBM 370, 4300 or comporable Hewlell Packard matchines. An excellent salary together with good fringe benefits complete in attractive parkage.

Contact: David Hendry commercial applications logether with at least one year's experience programming in

Systems Programmer

London

£9,500

This is a good opportunity to join a well established organisation who are market lenders In it is a good opportunity to join a well established organisation who are quirket ichoers in their field, and gain some valuable experience.

Antinhuum of one year using MVS or OS with knowledge of some or all of the following VTAM, CICS, IDMS or RACIF. Fluency in Assembler would be an advantage as would

exposure to vm.

Consideration will be given to more experienced applicants and of course the subry

Contact: Janet Chilvers

Senior Programmer

City

29.000 It is essential to have at least three years experience in PL/1 preferably working in a team environment and involvement to a high demectin the implementation of medium sized systems. Knowledge of CICS. IDMS and real-time systems would be a definite arterintage. Excellent prospects can be offered by this international organisation who are currently involved in a major development plan, including the upgrade of hardware, to enable them to utilise the latest technology.

Contact: Janet Chilvers

Engineering Support Specialist

A leading manufacturing organisation with plains and offices throughout Europe wishes to recruit a Saniar Technical Specialist to take responsibility for a new Engineering Services Group The new function will provide Engineers and Users with Joint d.p. firellities using Ilmesharing, packages or ministroin an existing incliwers.

Candidales, preférably graduates in Computer Science, must have at least 3 years experience in computing and be competent programmers. A background of Engineering Systems/packages, modelling or timestaring would obviously be an advantage. Ability to work closely with users is essential. Opportunity for travel.

Contact: Jist Baker

Junior Software Technician West London c. £6,000+Car+O/T

Following considerable graduol expansion, our Client, it market leader in miniard intero business systems: wishes to strengthen their englineering division with a mobile software lechnician

iccinician.

A thorough understanding of file based systems, operating systems and diagnostics are the main qualities required. This is a junior position but nevertheless an excellent opportunity to develop in a software role and move on to learn leadership. Anyone already in the engineering area with a desire to move into software may also be considered. Excellent Company package.

Contacts Brian Postles

JAMES BAKER ASSOCIATES. International Personnel Consultants. 32 Savile Row, London W1. Tel: 01-439 9311.

Mini/Micro Software E.E.C. Pkg. to £16K

Programmers, Systems Dasigners and Project Leadors with in-depth esperience roject Leadors with in-depin esperience of real-time systems are urgently required to join a number of project teams in Continental Europe. Of particular interest will be those candidates with a strong background in developing software for Communications or Process Control systems.

Whilst all applicants will be espected to be fluent in Assembler, Fortree, Algol or derivative languages, particular hardware exposure is not o requirement. All positions offered are on a permanent basis with relocation expenses and assistance in obtaining accommodation among the benefits our elients provide.

Raf: L/5/A

Jnr. Assembler & PL-1 Progs

City of London Salary to £7.5K

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Ref: LIS/B

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Central London Salary to £9K

A leading Systems House, based in Central London, is seeking to employ additional Programmars to joio its young, innovative softwere development team. Candidates should hove a degree in a numerate subject and at least two years' real-time programming experience in either FORTRAN, CORAL 66 or Assembler. Knowledge of particular hardware is not imponant, but

exposure to mini computers, in particular DEC's PDP range, HP2100, Prime 500 or Honeywell Level 6, would be advantageous. These positions will appeal to applicants who enjoy working as a meember of a anall team involved in the design, coding and testing of real-time software.

Ref: L/5/C

Management Consultants City and West End Salary to £15K

Our clients have an enviable reputation as a Management Consultancy and Research Organisation. The Company is now seeking several additional Consultants and Senior Coosultants. All candidates are expected to bave good personal communication skills, he self-confident and highly preseemble. Generally, preference will be given to graduates aged 28-34 years with

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Ref; L/5/D

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Sth. London & Surrey Salary to £10K

A leading supplier of Industrial and Process Control Hardware and Systems Software is seeking to recruit Applications Programmers and Support Analysts for its U.K. Headquarters. All respondents must offer at least pno year's experience in either Assembler or FORTRAN as a primary laosuage whilet those with exposure to ary language whilet those with exposure to PASCAL, BASIC or COBOL will be

favourably considered. You will play a sig-nificant role in all stages of software and eystems development from product planning to installation and live running. Since travel both outlonally and interna-tionally will form a significant part of the job function, mobility is an essential erite-rion for these positions.

Ref: L/5/R

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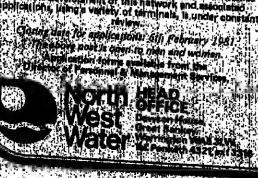
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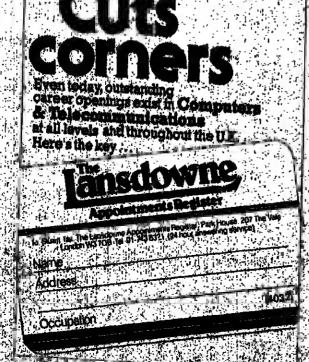
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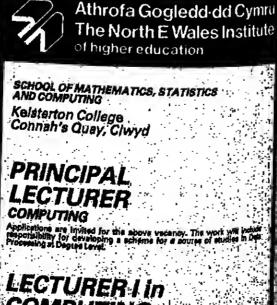
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Getting back to

basics — why

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do people buy?

IN recent weeks, several of my sales recruitment clients have asked when this column will get back to basic principles. When is there to be a return to a regular flow of commentary on selling ptactice for them to cut out and distribute to their salesmen? (Accompanied where appropriate by their own remarks, criticisms and demands!).

Remarkably, such questions have also been secompanied by the contribution of arbitrary comments like "I don't know how you keep thinking them up" and "it must be getting really difficult after all this time".

The fact is, writing the column is not in itself difficult; the real ptoblems are finding the time and discovering new warehuse control.

the real problems are finding the time and discovering new topics. (I must say you lot don't help too much with the salesman is no really selling salesman is no really selling an insurance policy, he is providing the policyholder with the security of knowing Devious The other day I was having that whatever tragedy might this kind of conversation with occur, his family will be pro-

s client, who helped me to realise that I started this column three and a half years ago. Since then many people who missed the earlier issues Benefits The person who buys a par ticular kind of car could be have moved into selling. Furthermore, a few remindferent influences. Company ers on the same topics ofter all prestige, financial investthis time won't do the experienced salespeople any larm cither. (Incidentally I have only rewritten one article desire to travel; but not simply the prospect of exchang-ing his hard earned income since starting out and within 48 hours of the version's appearance I had a letter on my

The conclusion of this the So, just to keep Obsorvant of Cheltenham in the picture, I intend to return substantially to matters of basic selling forthwith. Many previous subjects will be revisited and hopefully some new toples will also get into the setion. sis is simple: Do not sell the

Image

COURSES

Have you ever asked your-"Why do people buy?" Many people actually employed in selling have never really considered this question - surprising when your accordance.

prising when you consider now fundamental it is to individual sales success. The general assumption is that people sphications and programs will be held at the Covenity N eral assumption is that people buy things for what they ere; perhapt the buyers even believe the train.

People buy to satisfy a need subsequently in May, June, Senting of the people buy to satisfy a need subsequently in May, June, Senting of the people buy to satisfy a need subsequently in May, June, Senting of the people buy to satisfy a need subsequently in May, June, Senting of the people buy to satisfy a need subsequently in May, June, Senting of the people buy they are the people buy to satisfy a need subsequently in May, June, Senting of the people buy things for what they are; and people buy the people buy People buy to satisfy a need or desire. The actual produce or service they obtain is merely the means whereby give course aims to demanstrate the capability of microcomputers, to that requirement is fulfilled.

They do not buy the object they buy its implications, its image or the idea it promotes. In a business environment, the client's need unitally sales. In a business environment, the client's need usually takes the form of a problem that the client's socially aware he has a problem is a matter for the salesman to resolve early in the proceedings. A company, might, for lossance, have problems relating to warehousing and distribution:

The fact that the result of their deliberations is the purchase of a computer, and platet. Engineering Employers' Association, and their own feet computer. Burther information from Coventry and platet. Engineering Employers' Association, and their own feet computer. Trailing Centre, Woodland Grange, Losmington Sps, CV32. Tel. (0926) in the proceedings. A com-pany, might, for lossance, have problems relating to warehousing and distribution. The fact that the result of their deliberations is the pur-chase of a computer, is almost irrelayant.

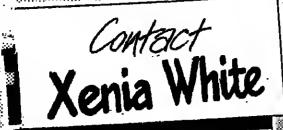
chase of a computer, is simost igrelevant.

Problem

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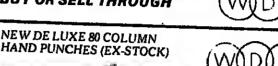
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